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LITTORAL ENVIRONMENT OBSERVATION (LEO) DATA SUMMARIES

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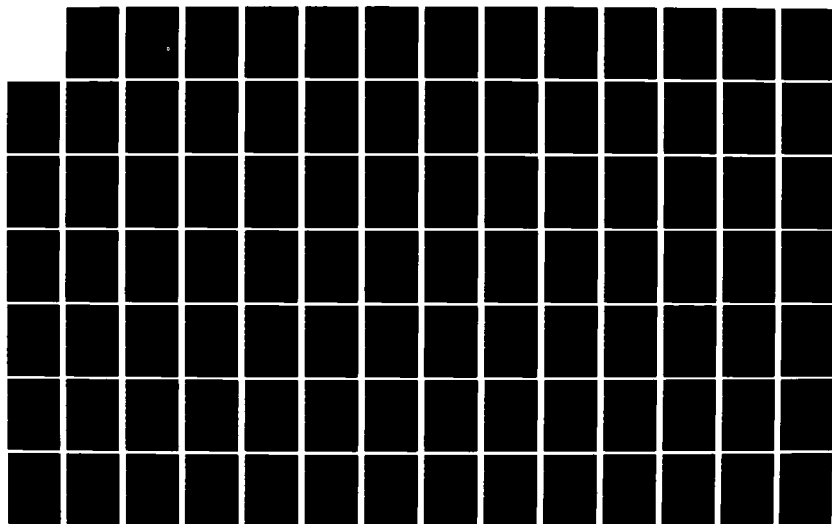
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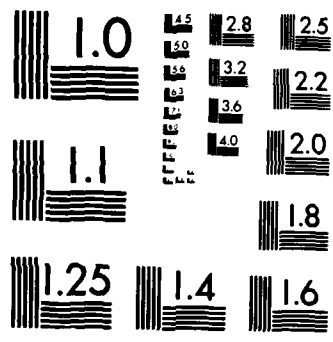
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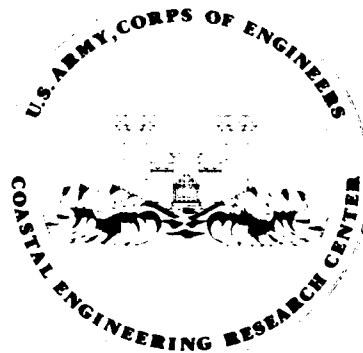
**Littoral Environment Observation  
(LEO) Data Summaries,  
Northern California, 1968-78**

by

Christine Schneider and J. Richard Weggel

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AUGUST 1982



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## PREFACE


This report provides a brief description of the Littoral Environment Observation (LEO) Program and its operation in northern California from 1968 to 1978. The work was carried out under the U.S. Army Coastal Engineering Research Center's (CERC) Visual Surf and Nearshore Current Observations work unit, Coastal Field Data Collection Program, Coastal Engineering Area of Civil Works Research and Development.

The report was prepared by Christine Schneider, Civil Engineering Technician, and Dr. J. Richard Weggel, Chief, Evaluation Branch, under the general supervision of Mr. N. Parker, Chief, Engineering Development Division. Helpful reviews by D.W. Berg, A. Szuwalski, E.F. Thompson, R.A. Jachowski, O.T. Magoon, R. Edmisten, and G. Armstrong are acknowledged.

Technical Director of CERC was Dr. Robert W. Whalin, P.E.

Comments on this publication are invited.

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TED E. BISHOP  
Colonel, Corps of Engineers  
Commander and Director

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# CONVERSION FACTORS, U.S. CUSTOMARY TO METRIC (SI) UNITS OF MEASUREMENT

U.S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	by	To obtain
inches	25.4	millimeters
	2.54	centimeters
square inches	6.452	square centimeters
cubic inches	16.39	cubic centimeters
feet	30.48	centimeters
	0.3048	meters
square feet	0.0929	square meters
cubic feet	0.0283	cubic meters
yards	0.9144	meters
square yards	0.836	square meters
cubic yards	0.7646	cubic meters
miles	1.6093	kilometers
square miles	259.0	hectares
knots	1.852	kilometers per hour
acres	0.4047	hectares
foot-pounds	1.3558	newton meters
millibars	$1.0197 \times 10^{-3}$	kilograms per square centimeter
ounces	28.35	grams
pounds	453.6	grams
	0.4536	kilograms
ton, long	1.0160	metric tons
ton, short	0.9072	metric tons
degrees (angle)	0.01745	radians
Fahrenheit degrees	5/9	Celsius degrees or Kelvins <sup>1</sup>

<sup>1</sup>To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use formula:  $C = (5/9) (F - 32)$ .

To obtain Kelvin (K) readings, use formula:  $K = (5/9) (F - 32) + 273.15$ .

LITTORAL ENVIRONMENT OBSERVATION (LEO) DATA SUMMARIES,  
NORTHERN CALIFORNIA, 1968-78

*by*  
*Christine Schneider and J. Richard Weggel*

I. INTRODUCTION

A major problem confronting coastal project planners and designers is the lack of data on waves and currents acting in the nearshore zone. Data obtained by recording instruments are expensive and appear to be rarely available at the precise locations under study. Also, since nearshore wave modifications are complex and highly variable over short distances, data that are transposed from one site to an adjacent one may not be reliable. Simple estimates of the direction from which waves approach the coast are also not generally available because wave gages are usually located seaward of the breakers. Wave direction is an important variable in determining the rate and direction of longshore sand transport, and one measurement that is easily estimated from visual observations.

The Littoral Environment Observation (LEO) Program was established to help overcome some of these problems by providing estimates of coastal phenomena at low cost. Under this program, volunteer observers are recruited to make daily estimates of variables such as breaker height, wave period, direction of wave approach, wind speed and direction, longshore current velocity, and beach slope. Other parameters estimated are the spacing between beach cusps and between rip currents when present. At some LEO sites, monthly sand samples are collected from the swash zone. Observers use simple, inexpensive equipment to obtain the data and, for some variables like wave height and direction, simply record a visual estimate of the variable. Because of the simple data collection procedures used, any individual observation may be of questionable accuracy, but statistical descriptions of the variables can provide insight into the local littoral environment. Also, LEO observations in a continuous series over time can be extremely useful in describing the physical coastal environment at a site. Observer bias that may exist for some sites can be partially compensated for by determining relative changes rather than absolute values of certain variables.

LEO data may be used to estimate longshore sand transport resulting from waves breaking at an angle to the shoreline. These waves produce longshore currents which may transport large quantities of sand along the shore. An empirical equation that relates longshore sand transport with wave conditions recorded under the LEO program is given in Chapter 4 of the Shore Protection Manual (SPM) (U.S. Army, Corps of Engineers, Coastal Engineering Research Center, 1977). Some recent theoretical developments allow the computation of sand transport rates using longshore current velocities (see Walton, 1980), which are also available through the LEO observation program. Therefore, LEO provides two separate (although not completely independent) methods of determining longshore transport rates. More details regarding LEO data collection procedures are available in Schneider (1981), and information on the comparison of LEO wave height and period data with data obtained from wave gages is available in Schneider and Weggel (1980).

This report presents data obtained at 25 LEO sites in northern California starting with inception of the program in 1968 and continuing through 1978.

The location of the sites is presented in the Table and shown on the location map in Figure 1. For examples of applications of the data, the reader is referred to publications listed in the Bibliography. The data collected at these 25 northern California sites represent output from the program during its formative years. Data collection methods and data recording formats over the years were modified as experience was gained. The most notable change was the recording of the wave approach direction. Recordings of early observations were based on the eight major compass directions; later recordings were based on the coastal sector method which recorded the sector from which the waves were approaching. The data presented in this report extend through the adoption of the protractor method. Later data collection efforts include the use of a protractor to estimate direction of wave approach to the nearest degree as measured from a line perpendicular to the shore. Other modifications over the years have been less significant.

Table. Code number, name, and location of 25 active LEO sites in northern California from 1968 to 1978.

Code No.	Name of site	Latitude N.	Longitude W.	Marsden square No.	One square	County
05310	Pelican Beach State Park	41°59.56'	124°12.50'	157	14	Del Norte
05313	Enderts Beach	41°42.50'	124°08.60'	157	14	Del Norte
05036	Prairie Creek Redwoods State Park	41°21.30'	124°04.50'	157	14	Humboldt
05307	Redwood Creek Beach	41°17.00'	124°05.57'	157	14	Humboldt
05306	Mad River	40°56.00'	124°08.00'	157	04	Humboldt
05302	Centerville Beach	40°34.40'	124°21.00'	157	04	Humboldt
05301	Shelter Cove	40°01.40'	124°03.90'	157	04	Humboldt
05026	MacKerricher Beach State Park	39°29.50'	123°47.67'	121	93	Mendocino
05025	Russian Gulch State Park	39°19.76'	123°46.99'	121	93	Mendocino
05024	Van Damme Beach State Park	39°16.38'	123°47.39'	121	93	Mendocino
05300	Navarro Beach	39°11.30'	123°45.40'	121	93	Mendocino
05023	Manchester Beach State Park	38°59.03'	123°42.39'	121	83	Mendocino
05020	Coast Rock Beach	38°26.76'	123°07.64'	121	83	Sonoma
05021	Wright's Beach	38°24.15'	123°05.89'	121	83	Sonoma
05355	Drake's Beach	38°01.85'	122°57.58'	121	82	Marin
05500	Bolinas Beach	37°54.28'	122°41.07'	121	72	Marin
05022	Stinson Beach State Park	37°53.60'	122°38.17'	121	72	Marin
05002	Thornton Beach State Park	37°41.92'	122°29.83'	121	72	San Mateo
05003	Francis Beach	37°28.05'	122°26.81'	121	72	San Mateo
05004	Natural Bridges State Park	36°57.02'	122°03.42'	121	62	Santa Cruz
05367	Capitola Beach State Park	36°58.40'	121°56.50'	121	61	Santa Cruz
05005	Twin Lakes State Park	36°57.70'	121°59.76'	121	61	Santa Cruz
05001	New Brighton Beach State Park	36°58.72'	121°56.10'	121	61	Santa Cruz
05006	Sea Cliff Beach	36°58.17'	121°54.73'	121	61	Santa Cruz
05007	Sunset Beach	36°53.80'	121°50.32'	121	61	Santa Cruz

## II. HISTORY OF NORTHERN CALIFORNIA LEO PROGRAM

During the fall of 1966 the Coastal Engineering Research Center (CERC) was asked by the U.S. Army Engineer District, San Francisco, to participate in a cooperative data collection program with the State of California. The program was to provide information on the natural forces and response elements in the littoral zone along the California coastline. CERC assumed the responsibilities of organizing the data collection and developing data collection

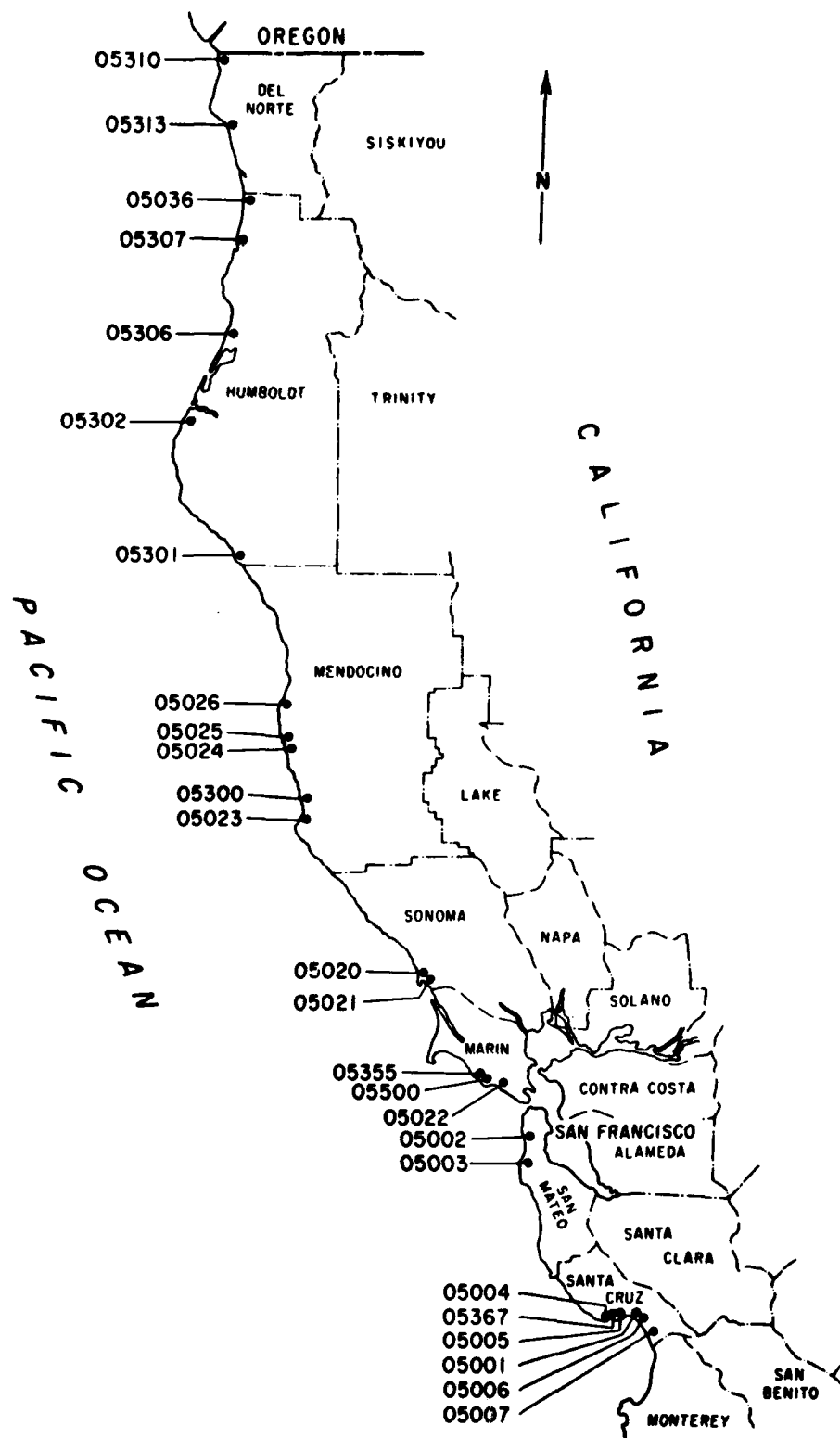


Figure 1. Location map of JEO sites between Pelican Beach State Park and San Jose Beach (Monterey Bay), California.

procedures and techniques, as well as serving as the central repository of the data. A pilot study was implemented at New Brighton State Beach, California, to evaluate instrumentation, data recording forms, and field procedures. Subsequently, volunteer observers were recruited by the California Division of Beaches and Parks, and the full-scale program was put into effect in the spring of 1968. The initial phases of the program were described by Berg (1968).

### III. SITE SELECTION

In selecting the LEO sites, data needs for planning, design, construction, operation, and maintenance of possible future projects were taken into consideration. The existence of other data collection programs and the proximity to adjacent LEO sites were also factors. Since the program was a cooperative effort with the State of California, the selection of site locations was based on accessibility of the Division of Beaches and Parks' volunteer observers. The distribution of sites was fairly uniform along the northern California coast from the northernmost site at Pelican Beach State Park near the Oregon border to the site at Sunset Beach just north of Moss Landing. Inaccessible beaches and rocky areas were generally not considered; however, the density of sites selected increased in heavily used sandy beach areas such as northern Monterey Bay near Santa Cruz. There were six sites in Monterey Bay and five sites in the San Francisco area between Drake's Beach in the north to Pacifica.

Two LEO sites, Pelican (05310) and Enderts (05313), were established in Del Norte County between the Oregon border and Point St. George. The northernmost site (Pelican) has a sandy beach backed by sand dunes, while at Enderts the terrain is rocky and the shore is backed by vertical cliffs.

The Humboldt County shoreline forms the western border of a number of parks, e.g., Redwood National Park and Prairie Creek Redwoods State Park, and includes many beaches. Two sites, Prairie Creek Redwoods (05036) and Redwood Creek Beach (05307), were located in this area south of the Klamath River. The Mad River (05306) and Centerville Beach (05302) sites were situated between Trinidad and Cape Mendocino, a distance of about 40 miles (64 kilometers). This part of the coast is a continuous sandy beach broken only by the entrance to Humboldt Bay and the outlets of several rivers. An additional site was established to the south at Shelter Cove (05301), which occupies a hook-shaped bay with a very rocky shoreline and backshore.

A total of five LEO sites were located in Mendocino County. The segment of coastline reaching from the Humboldt County line to Mistake Point, devoid of beaches and with limited access, is rocky and backed by cliffs. These shoreline characteristics are essentially the same for the MacKerricher (05026), Russian Gulch (05025), Van Damme (05024), and Navarro (05300) sites. The Manchester (05023) site was on a short stretch of sandy beach backed by dunes.

The majority of the Sonoma County shoreline is rocky and rugged. Goat Rock (05020) and Wright's Beach (05021) sites were located south of the Russian River. This reach is also rocky with cliffs occasionally reaching heights of 20 to 50 feet (6.1 to 15.2 meters).

The Drake's Beach (05355) site was situated within the Point Reyes National Seashore in Marin County. From Point Reyes south, the shoreline is crescent

shaped, forming Drake's Bay. Continuing south, the coastline is variable in character, including near-vertical offshore rocks and cliffs as seen at Bolinas (05500) to sandy beaches such as at Stinson Beach State Park (05022).

The initial segment of the San Mateo County shoreline is made up of steep sea cliffs overlooking small, flat, sandy beaches such as exists at the Thornton Beach State Park (05002) site. The shoreline south of Pillar Point forms a hook-shaped bay and contains the town of Half Moon Bay and the Francis Beach (05003) site.

Santa Cruz County has a shoreline 42 miles (67 kilometers) long. The northern half of the coast is rocky with a few small sandy beaches. To the south, a few miles below the town of Santa Cruz, the shoreline character changes to wide sandy beaches devoted mostly to recreational use; several small pocket beaches are also along the coastline. LEO sites were established at Natural Bridges (05004), Twin Lakes (05005), Capitola (05367), New Brighton (05001), Sea Cliff (05006), and Sunset (05007).

#### IV. DATA COLLECTION AND STANDARD ANALYSES

##### 1. Variables Measured.

Based on the results of the pilot study at New Brighton State Beach, the following littoral variables were selected for observation:

- (a) Wave conditions including breaker height, period, direction, and breaker type (i.e., plunging, spilling, surging or spill-plunge);
- (b) wind speed and direction;
- (c) littoral current speed and direction;
- (d) beach foreshore slope (in some cases other beach dimensions such as berm width, etc., were also determined);
- (e) tide level;
- (f) water temperature;
- (g) rip current spacings if rip currents are present;
- (h) beach cusp spacings if beach cusps are present; and
- (i) monthly photos, sand samples, and comments describing beach conditions and other events.

Surf and wind measurements, beach dimensions, rip currents, beach cusps, and water temperature were measured twice a day; photos and sand samples were taken once a month. An analysis of the LEO data collected during 1968 was presented by Szuwalski (1970).

The current LEO program includes estimates of breaker height and period, direction, and breaker type in the surf observations. Period is determined by measuring the time of passage past a fixed point of 10 consecutive breakers.

Breaker height is visually estimated to the nearest 10th of a foot. Direction of wave approach to the shoreline is estimated visually to the nearest degree using a hand-held protractor with its base oriented along the shoreline. Wind observations include speed and direction. Direction is referred to the eight-point compass directions by noting the sector from which the wind is blowing. A Dwyer wind meter is used to measure windspeed which is noted to the nearest mile per hour. Longshore current speeds are estimated by pacing the shore-parallel distance traveled in 1 minute of a dye packet thrown into the surf. Current direction to the right or left of an observer looking seaward is noted. Beach observations consist of estimates of the foreshore slope, measured to the nearest degree with an Abney topographic hand level. Monthly sand samples are taken from the swash zone at some sites. A typical instruction sheet provided to LEO observers under the current program is given in Appendix A.

## 2. Variation of Data Collection Techniques.

Through experience gained during the operation, some collection procedures were improved to meet specific needs. The most significant change was that of wave angle determination. The compass sector method used in early observations was changed to the coastal sector method which was later improved by the protractor method currently being used. Under the compass sector method an observer determined the orientation of the shoreline with respect to north, then recorded the wave approach from one of the eight primary compass directions. The coastal sector method eliminated the need to determine the approximate orientation of the shoreline. Direction of wave approach was estimated using the simplified protractor shown in Figure 2. Examples of compass sector and coastal sector output are shown in Figure 3.

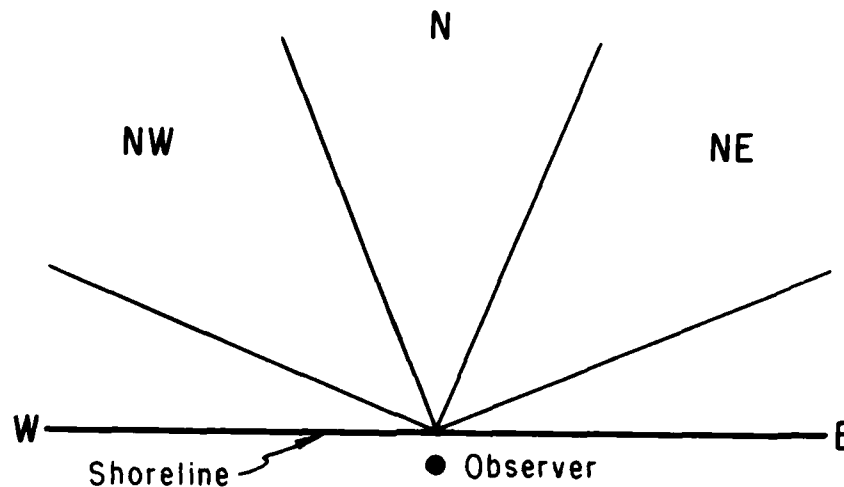
In the years following 1973 the coastal sector method was supplanted by the protractor method. A protractor, which is printed on the back of the LEO form, is oriented with its base parallel to the general shoreline orientation; the observer sights along the protractor in the direction of wave approach and records the visually estimated direction to the nearest degree. Angles greater than  $90^\circ$  represent waves approaching generally from the right and driving the longshore current to the left, for an observer looking seaward. Angles less than  $90^\circ$  represent waves approaching from the left and driving the longshore current to the right. Shore-normal waves (wave crests parallel with shore) are recorded as  $90^\circ$  angles. The protractor is shown in Figure 4.

## 3. Standard Computer Output.

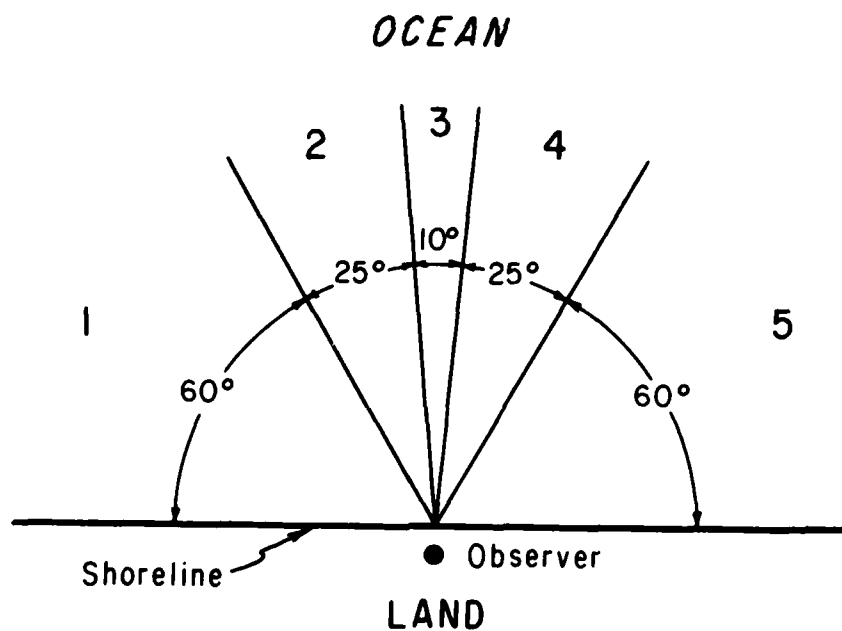
LEO data are normally analyzed with data sets comprised of 1 year of observations. Where an accumulation of 2 or more years of data is available, it may also be analyzed as a complete data set.

As stated previously, this report makes the northern California LEO data available for use to coastal planners, designers, and researchers. Because of the quantity of data collected during the 1968-78 program it was not practical to present all the data analyses and summary formats available, however, basic data summaries by year are given.

a. Yearly Summary Report. The yearly summary report, as shown in Figure 3, provides monthly averages of breaker height, breaker period, angle of breaker approach to the shoreline, breaker type, longshore current velocity, foreshore



a. Compass Sector Method



b. Coastal Sector Method

Figure 2. Simplified protractors used in both the compass sector (a) and coastal sector (b) methods to determine wave direction during early stages of LEO program.



5004 NATURAL BRIDGES			CALIFORNIA					SUMMARY FOR PERIOD STARTING 1-1-70 AND ENDING 11-26-70.									
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.				
SURF OBS.																	
HEIGHT (FT)																	
MEAN	3.08	2.12	2.06	1.94	2.75	2.68	3.10	2.92	3.10	3.25	2.87	0.00	2.70				
STD DEV	1.42	.88	.78	1.01	3.77	3.34	2.07	.93	.97	1.50	1.01	0.00	1.90				
NO. OBS.	99.	80.	53.	51.	50.	60.	62.	62.	58.	57.	17.	0.	580.				
PERIOD (SEC)																	
MEAN	11.45	12.44	12.10	11.93	12.63	11.60	11.63	12.08	12.41	12.42	13.04	0.00	12.11				
STD DEV	1.86	1.35	1.41	2.70	3.19	1.70	1.63	1.89	2.39	2.33	3.45	0.00	2.23				
NO. OBS.	99.	92.	52.	55.	55.	50.	62.	62.	50.	54.	17.	0.	580.				
DIRECTION																	
COASTAL SECTOR																	
OCC. 1	0.00	0.00	0.00	11.54	0.00	0.00	0.00	0.00	1.75	1.72	5.00	0.00	1.50				
2	0.00	0.00	0.00	26.92	20.00	21.67	27.62	21.67	19.30	25.00	50.00	0.00	25.50				
3	0.00	0.00	0.00	53.05	74.00	71.67	70.97	70.53	70.95	72.41	35.29	0.00	71.20				
4	0.00	0.00	0.00	7.69	0.00	4.67	1.81	0.00	0.00	0.00	0.00	0.00	1.70				
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
NO. OBS.	0.	0.	0.	26.	50.	60.	62.	60.	57.	54.	17.	0.	390.				
COMPASS SECTOR																	
OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
S	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00				
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
NO. OBS.	99.	90.	52.	26.	0.	0.	0.	0.	0.	0.	0.	0.	100.				
WRECKER TYPE																	
NOCC SPILL	43.05	100.00	90.74	85.71	100.00	92.64	86.89	63.33	45.61	52.63	50.62	0.00	79.21				
SP/PL	0.00	0.00	0.00	3.97	0.00	1.79	13.11	20.33	26.32	14.04	35.29	0.00	9.70				
PLUNGE	10.17	0.00	0.26	10.71	0.00	3.97	0.00	0.33	28.07	13.33	5.00	0.00	10.31				
SURGE	6.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
NO. OBS.	99.	91.	44.	50.	90.	50.	61.	60.	57.	57.	17.	0.	580.				
CURRENT OBS.																	
NET MEAN	.00	-.00	-.01	-.02	-.03	-.02	.00	-.10	-.07	-.03	.01	0.00	-.02				
GROSS MEAN	.19	.11	.11	.08	.08	.08	.08	.10	.08	.08	.01	0.00	.08				
STD DEV	.17	.10	.13	.08	.07	.06	.07	.14	.11	.09	.02	0.00	.11				
NO. OBS.	10.	20.	20.	28.	27.	30.	31.	32.	29.	28.	7.	0.	294.				
FOR SHORE SLOPE																	
MEAN (DEG)	5.17	2.99	2.44	1.22	1.63	1.93	1.65	1.16	2.14	1.97	1.80	0.00	2.10				
STD DEV	1.05	.88	2.14	.82	.69	.37	.80	.37	.52	.19	.35	0.00	1.20				
NO. OBS.	10.	20.	25.	27.	27.	30.	31.	32.	28.	29.	0.	0.	291.				
RIPS % OCC																	
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
NO. OBS.	99.	92.	54.	57.	50.	60.	62.	62.	50.	50.	17.	0.	575.				
CUSPS % OCC.																	
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
NO. OBS.	99.	92.	54.	57.	50.	60.	62.	62.	50.	50.	17.	0.	575.				

Figure 3. Typical yearly summary report, LEO site 05004, Natural Bridges, California.

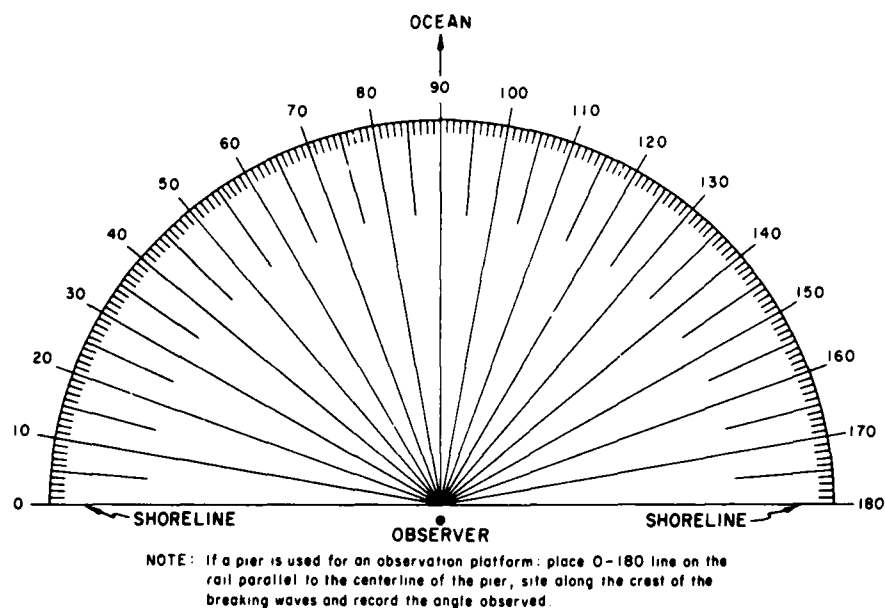


Figure 4. Protractor on back of LEO form which is currently being used to obtain wave direction.

slope, and rip current and beach cusp spacings. Monthly means, standard deviations, the number of observations taken, frequencies of occurrence (in percent), and the number of observations of calm conditions are also presented. For example, the first column in Figure 3 represents the summary of LEO observations made for the month of January 1970 at site 05004, Natural Bridges, near Santa Cruz, California. During January, the average breaker height was 3.08 feet (0.9 meter) and the standard deviation of the observations was 1.42 feet (0.4 meter); these values are based on 59 observations made during the month. The mean and the standard deviation of the wave period during January were 11.45 and 1.86 seconds, respectively, based on the 59 observations.

During January 1970 the compass sector method was being used and all waves were observed to approach from the south. The coastal sector method was adopted about mid-April 1970. This method gives a better resolution of wave direction than does the compass sector method, a major factor in the decision to modify the method. Note that for the months when the coastal sector method was in use (Fig. 3, April through November), a large majority of waves were in sector 3 indicating shore-normal or nearly shore-normal wave approach. This lack of resolution between upcoast and downcoast wave propagation and the resulting direction of sediment transport by longshore currents led to the subsequent adoption of the protractor method. The majority of breakers observed in January, 83.05 percent, were of the spilling type. Plunging and surging waves comprised 10.17 and 6.78 percent, respectively, of the observations. Calm conditions were not recorded. Longshore current observations indicated that the net average current was 0.06 foot (0.02 meter) per second. This represents the average of both positive (upcoast) and negative (downcoast) current velocities; hence, a zero or near-zero value does not imply that the average current speed was close to zero but rather that the vector average was close to zero. The gross mean is the average of the absolute values of the observed current speeds. For January this value was 0.19 foot (0.06 meter)

per second with a standard deviation of 0.17 foot (0.05 meter) per second. Current observations were made about once a day since only 30 observations were made. Foreshore slope averaged  $3.17^\circ$  with a standard deviation of  $1.05^\circ$  based on 30 observations. There were no observed rip currents or beach cusps in January 1970 at Natural Bridges.

The last column in the Yearly Summary Report (Fig. 3) gives data values averaged for all the data acquired during the year.

b. Wind Roses. The wind rose plots represent wind speeds and directions recorded during the entire period of record. An example is shown in Figure 5. Windspeeds are plotted as frequency of occurrence, in percent, according to the compass direction from which they blow. The term "insufficient data" indicates that less than 10 wind observations were taken for that particular month.

## V. OTHER TYPES OF DATA ANALYSES AVAILABLE

Computer programs in a number of analyses and formats are available that provide various additional statistical summaries of LEO data. These programs will be provided to users on request. Examples of the various data formats follow.

### 1. Daily LEO Printouts.

An example of a daily LEO printout is given in Figure 6. The listing is simply the daily values of the LEO observations presented chronologically for a given month. Each month of data is listed on separate sheets. The date and time of each observation are given along with the values of each data entry made for that series of observations. Each line corresponds to the data entered on a completed LEO form. For example, for the observation made at 1515 hours (24-hour clock) on 3 April 1968 (Fig. 6, second line) breakers 3 feet (0.9 meter) high with a period of 20.0 seconds were reported. Surging breakers occurred and the waves were generally approaching from the southwest. The windspeed was 20 miles (32 kilometers) per hour, blowing from the northwest. No currents were observed at this time. (The asterisks indicate that no observation was made; zeros indicate that an observation was made but its value was zero.)

### 2. Frequency and Cumulative Frequency Histograms of Breaker Height and Period.

These printouts provide an annual statistical summary of wave height and wave period probabilities. Figure 7 is an example of wave height histograms prepared for data collected between April 1968 and November 1970 at Natural Bridges. Data are tabulated for wave heights at 1-foot (0.3 meter) intervals. For example, Figure 7 shows that 32.6 percent (576 of the 1,765 observations) of the wave height observations made at Natural Bridges fell in the interval  $2.0 \leq H_b < 3.0$  where  $H_b$  is the breaker height. The lower half of Figure 7 shows that 56.1 percent of the waves (991 of 1,765 observations) at Natural Bridges were greater than or equal to 30 feet (9.1 meters). Figure 8 provides similar information for wave periods at 1-second intervals.

### 3. Joint and Marginal Probabilities for Breaker Height and Period.

The probability distribution of wave heights for a given wave period interval is available in tables of the joint wave height and wave period probabilities.

# WIND ROSE - 5004 NATURAL BRIDGES

ALPINE, CALIF.

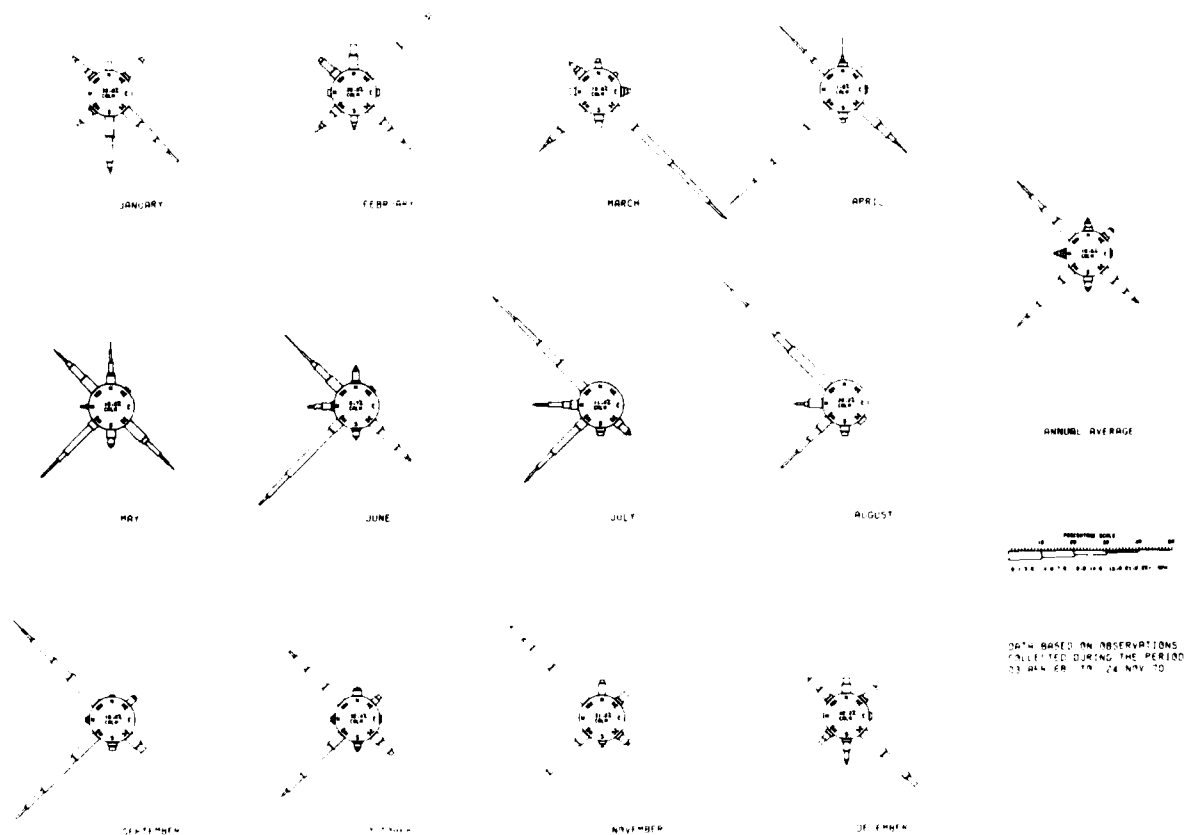


Figure 5. Typical wind rose plots, LEO site 05004, Natural Bridges, California.

LITTORAL ENVIRONMENT OBSERVATIONS (LEO)															
NATURAL BRIDGES			(05004), CALIFORNIA					APR 1968					APR 1968		
APR 1968															
DAY	TIME	WAVE SEC PERIOD	WAVE FEET HEIGHT	WAVE DIN	WAVE TYPE	WIND MPH SPEED	WIND DIR	LONGSHORE FT/SEC CURRENT	LONGSHORE DIR	HEMM FEET FLV	HEMM FEET REACH	SHORE DEG SLOPE	WIPS - INREGULAR SPACING-Feet	WATER DEG F TEMP	TIDE
3	900	11.0	4	SW	SPILL	4	NE	.30	-1	6.5	135	2		00	1
3	1515	20.0	3	SW	SURGE	20	NW	0.00	00	0.00	0.00	00		00	00
4	915	13.0	3	S	SPILL	6	NE	.40	-1	5.0	135	2		00	01
4	1515	14.0	00	S	BURGE	15	SW	0.00	00	0.00	0.00	00		00	00
5	0000	13.0	2	S	PLUNGE	20	NW	0.00	00	0.00	0.00	00		00	00
5	930	10.5	4	S	SPILL	10	NW	.32	-1	4.5	135	2		00	-1
6	1115	13.0	2	S	SPILL	5	NW	.33	1	4.5	135	2		00	-3
6	1500	9.0	2	S	PLUNGE	7	NW	0.00	00	0.00	0.00	00		00	00
7	1115	12.0	2	S	SPILL	7	NW	.30	1	4.5	135	2		00	-1
7	1500	9.0	3	00	PLUNGE	5	NW	0.00	00	0.00	0.00	00	30	00	00
8	930	14.0	2	S	SPILL	3	SW	.00	-1	5.0	135	1	50	00	-1
8	1530	10.0	3	S	SPILL	7	SW	0.00	00	0.00	0.00	00		00	00
9	1130	14.5	3	S	SPILL	6	SW	.10	-1	.4	141	2		00	-3
9	1515	14.5	3	S	PLUNGE	5	SW	0.00	00	0.00	0.00	00		00	00
10	1130	15.0	5	S	PLUNGE	4	SW	.30	1	4.0	150	2		00	-1
10	1515	4.5	3	S	SPILL	7	SW	0.00	00	0.00	0.00	00		00	00
11	0000	14.5	3	S	SPILL	9	SW	0.00	00	0.00	0.00	00		00	00
11	030	13.5	0	S	PLUNGE	0	CA	.33	1	9.5	150	2	90	00	3
12	015	13.0	5	S	SPILL	5	SW	.33	1	4.5	150	2		00	2
12	1500	12.5	3	S	SPILL	4	SW	0.00	00	0.00	0.00	00	05	00	00
13	1115	13.0	00	S	SPILL	4	SW	.33	1	9.5	150	2	95	00	4
13	1315	11.0	3	S	PLUNGE	9	SW	0.00	00	0.00	0.00	00		00	00
14	1115	13.0	4	S	PLUNGE	15	SW	.42	1	95.0	150	2		00	04
14	1300	12.0	2	S	PLUNGE	9	SW	0.00	00	0.00	0.00	00	40	00	00
15	900	14.0	4	S	PLUNGE	4	SW	.17	1	90.5	150	2		00	0
15	1500	12.5	3	S	PLUNGE	10	SW	0.00	00	0.00	0.00	00		00	00
16	915	13.0	1	S	SURGE	10	SW	0.00	0	5.0	135	1	50	00	1
16	1515	13.0	1	SW	SURGE	15	NW	0.00	00	0.00	0.00	00		00	00
17	930	14.5	3	S	SURGE	4	NE	.05	-1	5.0	135	1		00	-1
17	1515	14.0	2	S	SURGE	7	NW	0.00	00	0.00	0.00	00		00	00
18	915	15.5	3	S	SPILL	6	SW	0.00	-1	5.0	150	1	30	00	1
18	1515	13.0	4	S	SURGE	15	NW	0.00	00	0.00	0.00	00		00	00
19	1515	15.0	2	00	SPILL	9	SW	0.00	00	0.00	0.00	00		00	00
20	915	12.5	3	SW	PLUNGE	5	SE	.32	-1	5.0	150	2		00	-1
20	1515	14.5	2	S	SPILL	15	NW	0.00	00	0.00	0.00	00		00	00
21	915	12.5	3	SW	SPILL	5	SW	1.50	-1	5.0	150	1	30	00	1
21	1500	9.0	2	S	SURGE	20	SW	0.00	00	0.00	0.00	00		00	00
22	0000	19.5	2	S	SURGE	9	SW	0.00	00	0.00	0.00	00		00	00
22	1030	10.5	3	S	PLUNGE	4	SW	0.00	0	5.0	150	1		00	-2
23	0000	13.5	4	S	SPILL	5	SW	.15	1	4.0	150	3	102	00	-2
23	1545	15.0	1	S	SURGE	10	SW	0.00	00	0.00	0.00	00		00	00
24	0000	12.0	1	S	SURGE	20	SW	0.00	00	0.00	0.00	00		00	00
24	915	14.0	1	S	SPILL	8	SW	0.00	0	5.0	150	2	60	00	-2
25	1500	13.5	2	S	SURGE	12	SW	0.00	00	0.00	0.00	00		00	00
26	900	11.0	2	S	SPILL	1	SW	.25	1	5.0	150	1	50	00	-1
26	1500	13.0	2	S	PLUNGE	15	SW	0.00	00	0.00	0.00	00		00	00
27	1015	13.0	4	S	PLUNGE	9	SW	.33	-1	5.0	150	1		00	4
27	1500	8.0	3	S	SURGE	10	SW	0.00	00	0.00	0.00	00	40	00	00
28	1500	13.5	2	S	SURGE	6	SW	0.00	00	0.00	0.00	00	50	00	00
29	945	13.5	4	S	PLUNGE	0	SW	.17	-1	5.0	150	1		00	2
29	1500	10.0	2	S	SURGE	15	SW	0.00	00	0.00	0.00	00	60	00	0
30	030	13.0	1	S	PLUNGE	4	SW	.17	-1	5.0	150	1		00	1
30	1500	13.0	1	S	SURGE	15	SW	0.00	00	0.00	0.00	00	50	00	00

000 MEANS ITEM WAS LEFT BLANK

01 LONGSHORE CURRENT DIRECTION INDICATES FLOW TO THE LEFT, 1 RIGHT FLOW, AND 0 NO FLOW

Figure 6. Typical daily LEO printout, LEO site 05004, Natural Bridges, California.

# WAVE HEIGHT HISTOGRAMS 5004 NATURAL BRIDGES

DATA COLLECTED FROM 4/ 3/68 TO 11/24/70

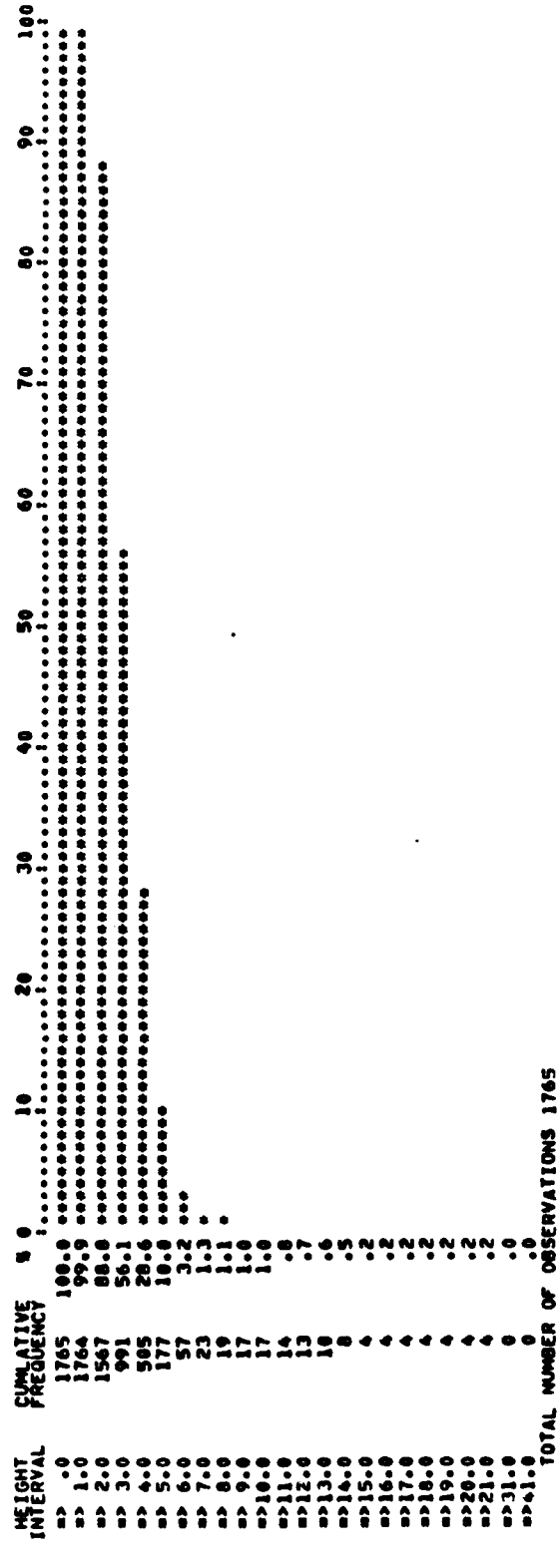
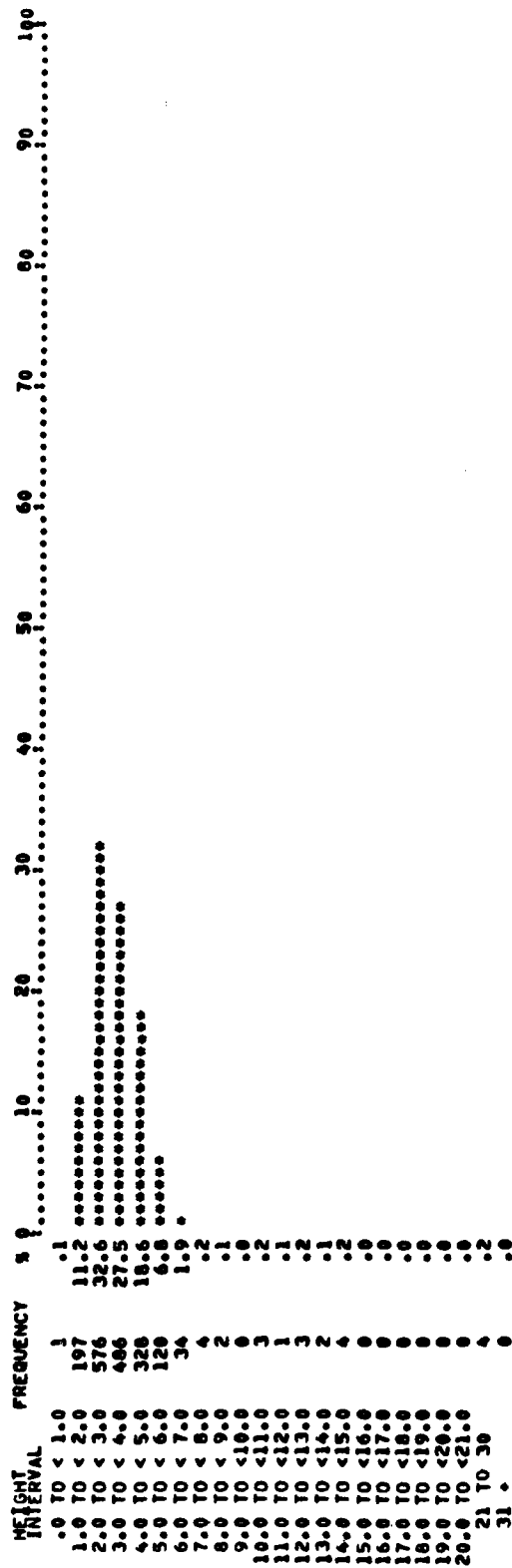


Figure 7. Typical breaker height frequency and cumulative frequency histograms, LEO site 05004, Natural Bridges, California.

# WAVE PERIOD HISTOGRAMS 5004 NATURAL BRIDGES

DATA COLLECTED FROM 4/ 3/68 TO 11/24/70

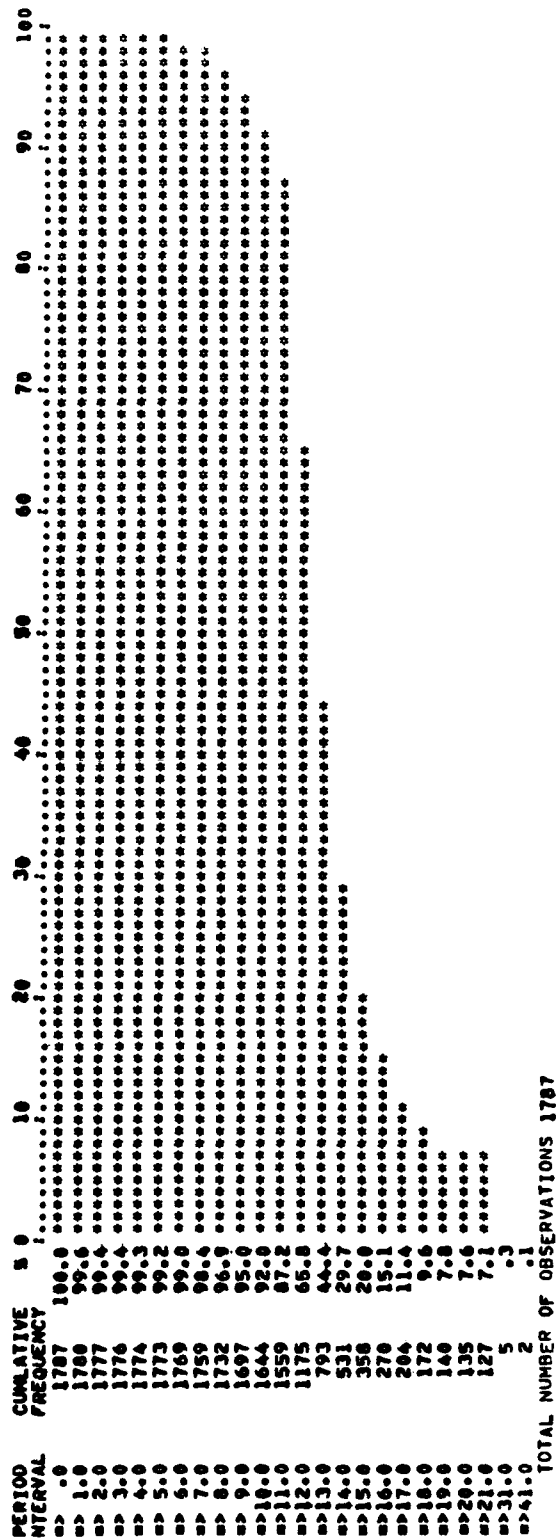


Figure 8. Typical breaker period frequency and cumulative frequency histograms, LEO site 05004, Natural Bridges, California.

Figure 9 is an example of the Natural Bridges data obtained between April 1968 and December 1968. The table shows that 38 of 480 observations had wave heights in the interval  $2.0 \leq H_b \leq 2.9$  (since wave heights are only reported to the nearest 0.1 foot this interval is effectively  $2 \leq H_b < 3.0$ ) and with periods,  $T$ , in the interval  $13.0 \leq T \leq 13.9$  (effectively  $13 \leq T < 14.0$ ). Conditional probabilities can be developed from information in the table. The marginal probability data for wave periods are given in the last three columns of the table, while marginal probability data for wave heights are given in the bottom three rows. To a certain extent, the marginal probability data are redundant with the probability data given in the histograms of Figures 7 and 8.

#### 4. Monthly Average Breaker Height and Period Versus Time.

The time variations of the monthly average breaker height and period are plotted against time in Figure 10 and seasonal variations of the parameters are evident. The figure shows that average monthly wave heights dipped below 2 feet (0.6 meter) during the spring and increased to near 3 feet (0.9 meter) during autumn in 1970.

#### 5. Longshore Current Histogram.

The longshore current histogram provides information on the frequency of occurrence of current speeds and direction within specific speed intervals. The current speed is tabulated in increments of 0.25 foot (0.08 meter) per second. For example, tabulation in Figure 11 shows no current (calm) conditions prevailed 29.9 percent of the time. For an observer facing seaward, currents moving to the right at speeds between 0.5 and 0.75 foot (0.1 and 0.2 meters) per second occurred 2.1 percent of the time. Currents moving to the left at the same speed interval prevailed 2.1 percent of the time.

#### 6. Longshore Current Versus Time.

Figure 12 is an example of the time history of longshore current velocity at Natural Bridges for 1969. Each current observation is represented by a vertical line above or below the horizontal line for currents to the right or left, respectively. The length of the line corresponds with the magnitude of the velocity. The monthly average current velocities are represented by circles. The figure shows that the average January current velocity was about 0.25 foot per second to the left, and the maximum observed current velocity in January was about 1.0 foot per second to the left.

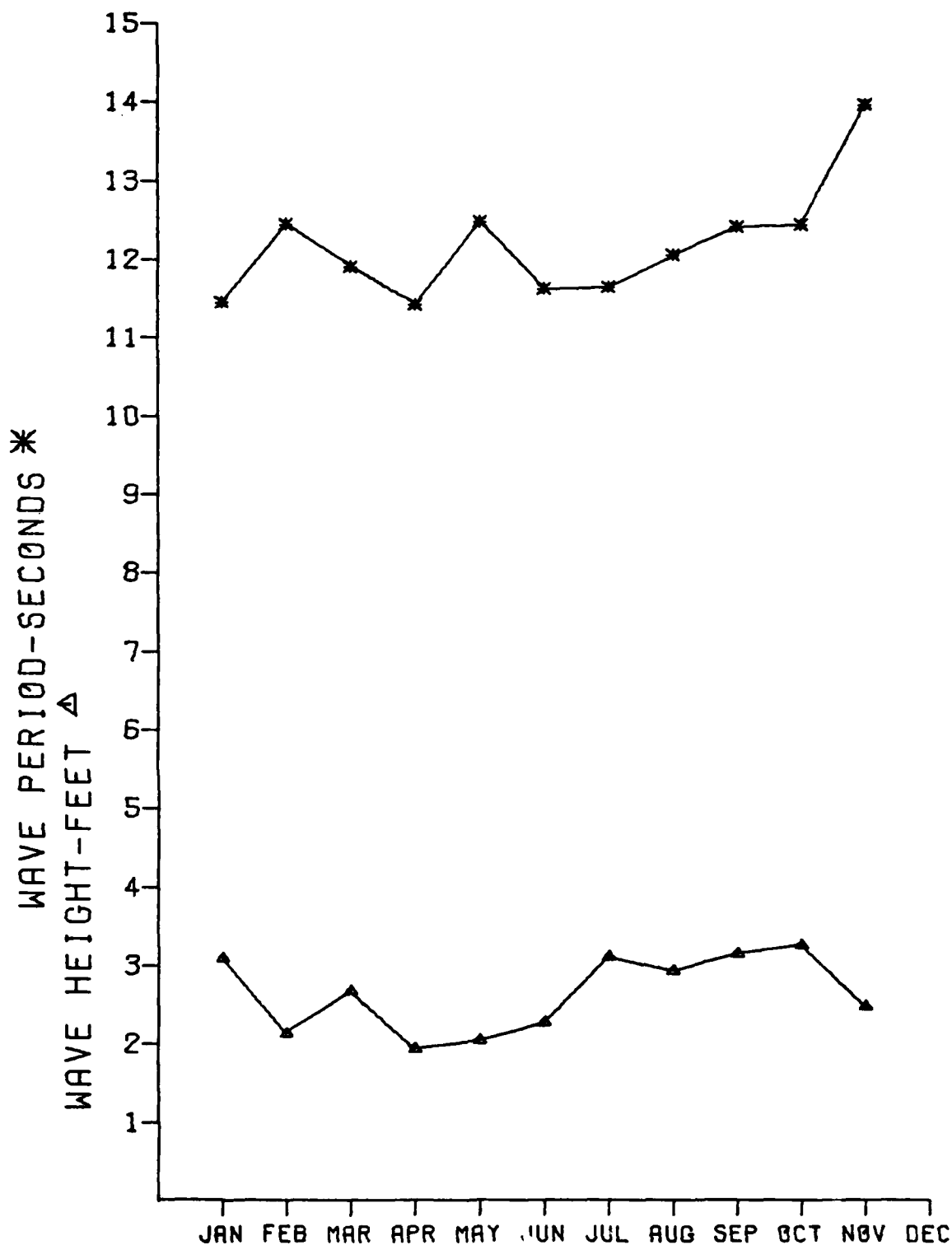
### VI. DATA PRESENTATION

The data from the 25 northern California sites are presented in Appendix B in geographic order, starting with the northernmost site at Pelican Beach State Park to the southernmost site at Sunset Beach in Monterey Bay. All the data for a given site are together. Yearly summary reports are given for each year during which some data were collected, even if data were obtained for only a few observations or a few months during that year. These annual summaries are followed by a cumulative annual summary, in the same format, of all data from the site. The period of record covered by each summary is given in the upper right-hand corner of the sheet.



DATA COLLECTED FROM 3 APR 68 TO 31 DEC 68															NATURAL BRIDGES		
WAVE PERIOD VS. WAVE HEIGHT															NUMBER OF OBSERVATIONS		
PERIOD*	0.9	1	2	3	4	5	6	7	8	9	10	11	12	13+	TOTAL	PERCENT	CUMULATIVE PERCENT
0.0- .9	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	.6	.6
1.0- 1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0	.6
2.0- 2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0	.6
3.0- 3.9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	.2	.8
4.0- 4.9	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	.2	1.0
5.0- 5.9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	.2	1.2
6.0- 6.9	0	0	0	1	1	0	1	0	0	0	0	0	0	0	3	.6	1.8
7.0- 7.9	0	2	1	3	2	3	0	0	0	0	0	0	0	0	11	2.3	4.2
8.0- 8.9	0	3	3	2	1	0	0	0	0	0	0	0	0	0	9	1.9	6.0
9.0- 9.9	0	2	6	2	3	1	0	0	0	0	0	0	0	0	14	2.9	9.0
10.0-10.9	0	5	6	1	3	2	0	0	0	0	0	0	0	0	17	3.5	12.5
11.0-11.9	0	7	12	7	4	1	0	0	0	0	0	0	0	0	31	6.5	19.0
12.0-12.9	0	20	26	30	11	1	1	0	0	0	0	0	0	0	89	18.5	37.5
13.0-13.9	0	17	38	46	25	7	1	0	0	0	0	0	0	0	134	27.9	65.4
14.0-14.9	1	10	33	28	13	4	1	1	1	0	0	0	0	0	93	19.4	84.8
15.0-15.9	0	2	11	10	8	1	0	1	0	0	0	0	0	0	33	6.9	91.7
16.0-16.9	0	2	6	7	0	0	0	0	0	0	0	0	0	0	15	3.1	94.8
17.0-17.9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	.2	95.0
18.0-18.9	0	1	1	0	0	0	1	0	0	0	0	0	0	0	3	.6	95.6
19.0-19.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0	95.6
20.0-20.9	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	.4	96.0
21.0-21.9	0	1	1	2	0	0	0	0	0	0	0	0	0	0	4	.8	96.8
22.0-22.9	0	1	1	2	1	0	0	0	0	0	0	0	0	0	5	1.0	97.9
23.0-23.9	0	1	3	1	0	0	0	0	0	0	0	0	0	0	5	1.0	99.0
24.0-24.9	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	.4	99.4
25.0-50.0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	3	.6	100.0
TOTAL OBS	3	75	154	144	74	22	5	2	1	0	0	0	0	0	480		
PERCENT	.6	15.6	32.1	30.0	15.4	4.6	1.0	.4	.2	.0	.0	.0	.0	.0			
CUMULATIVE PERCENT	.6	16.2	48.3	78.3	93.7	98.3	99.4	99.8	100.0	100.0	100.0	100.0	100.0	100.0			

Figure 9. Typical joint and marginal probability table for breaker height and period, LEO site 05004, Natural Bridges, California.



## NATURAL BRIDGES CALIFORNIA

DATA COLLECTED BETWEEN 1 JAN 70 AND 24 NOV 70

Figure 10. Typical monthly average breaker height and period versus time plot, LEO site 05004, Natural Bridges, California.

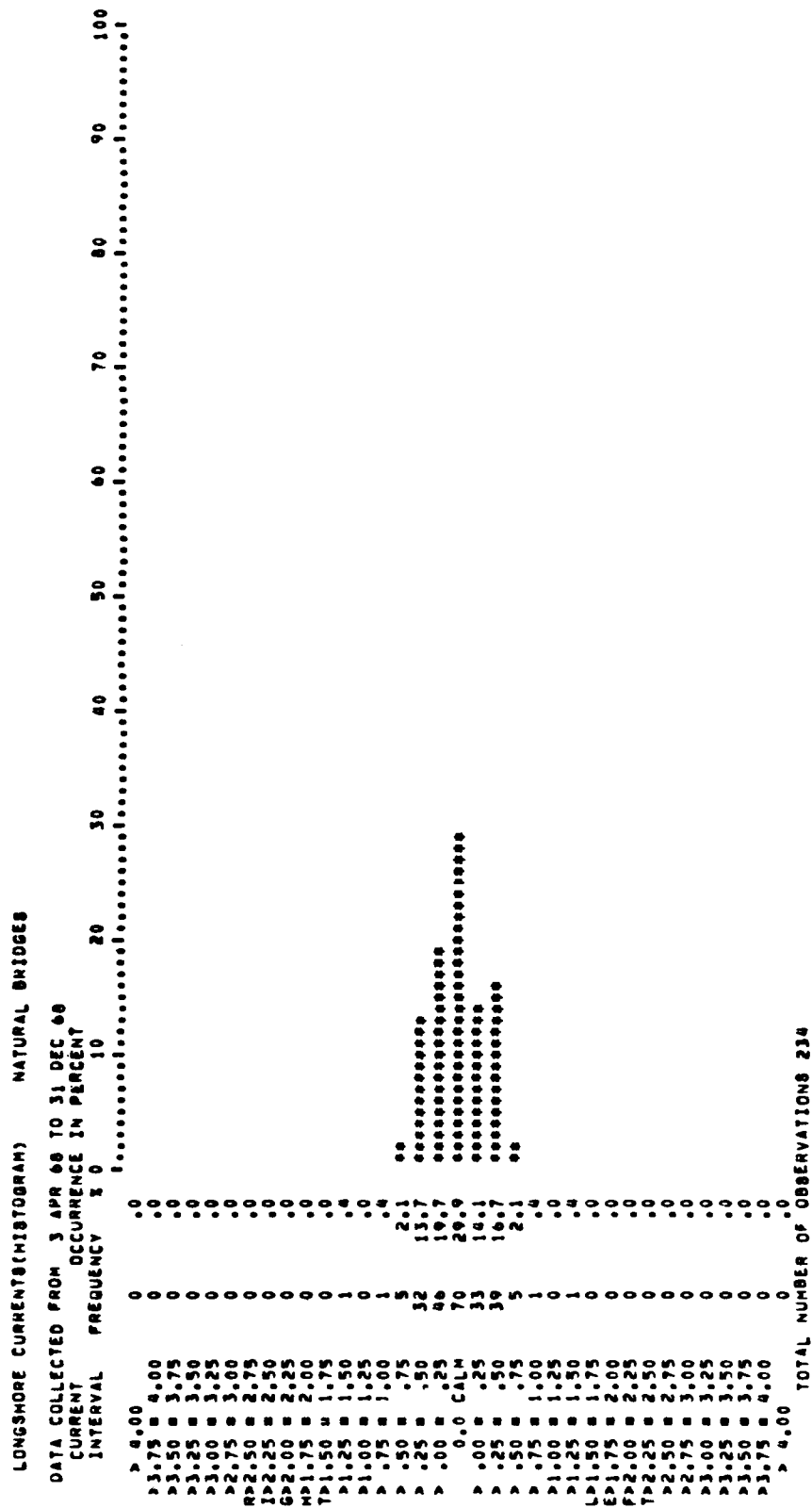


Figure 11. Typical longshore current histogram, LEO site 05004, Natural Bridges, California.

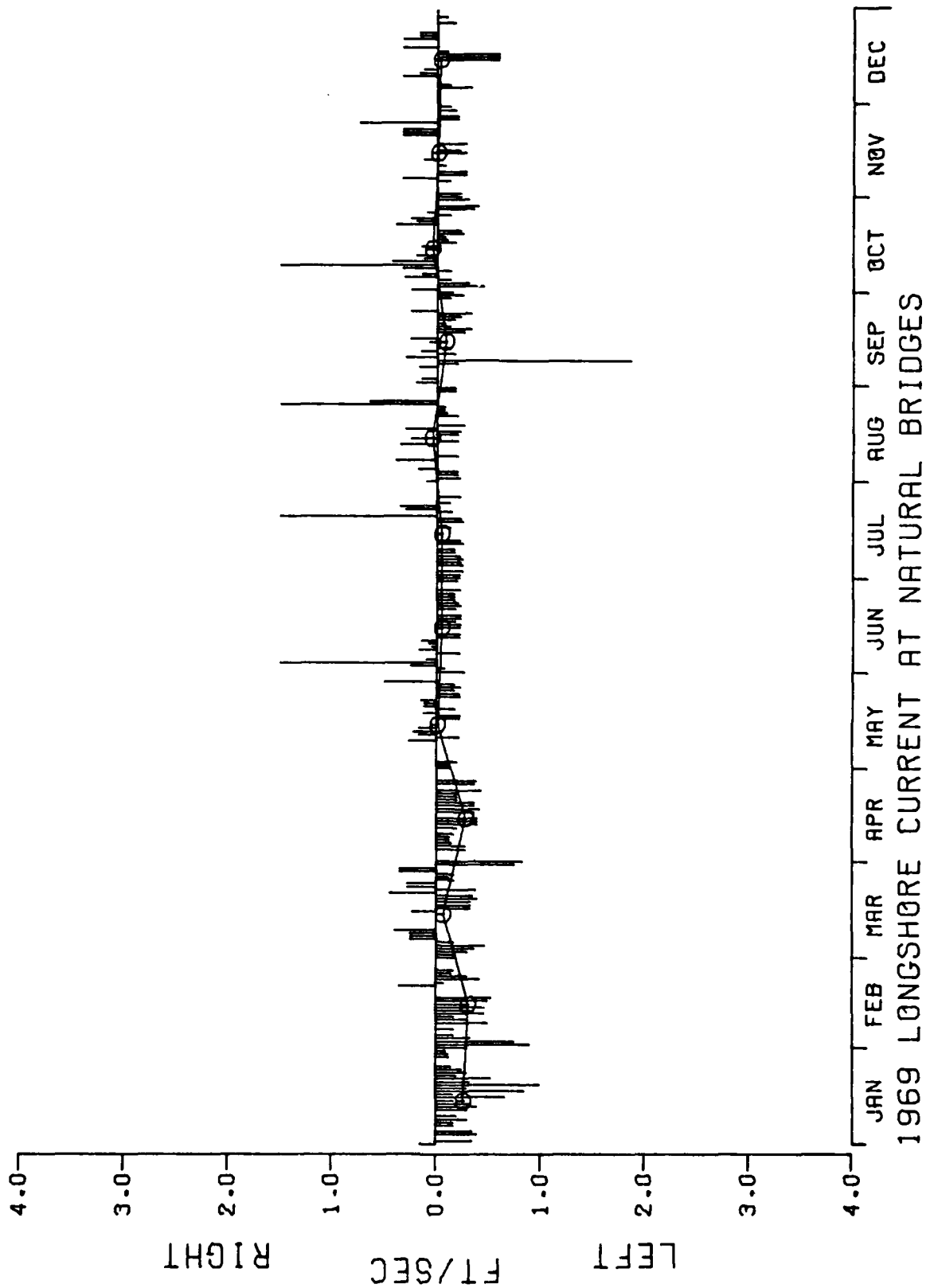


Figure 12. Typical plot of longshore current versus time, LEO site 05004, Natural Bridges, California.

The annual summary reports are followed by a page of wind roses summarizing monthly wind conditions for all data available at a site. Note that some of the January wind roses may have been constructed from data obtained during January of several different years. An annual average wind rose, based on all wind observations available for a site, is given above the legend indicating the period of record on the same page.

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APPENDIX A

LITTORAL ENVIRONMENT OBSERVATIONS INSTRUCTION SHEET



<b>LITTORAL ENVIRONMENT OBSERVATIONS</b> <b>RECORD ALL DATA CAREFULLY AND LEGIBLY</b>													
<b>SITE NUMBERS</b> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>					<b>YEAR</b> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>		<b>MONTH</b> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>		<b>DAY</b> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>		<b>TIME</b> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>		
<b>WAVE PERIOD</b> Record the time in seconds for eleven (11) wave crests to pass a stationary point. If calm record 0.					<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>			<b>BREAKER HEIGHT</b> Record the best estimate of the average wave height to the nearest tenth of a foot				<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>	
<b>WAVE ANGLE AT BREAKER</b> Record to the nearest degree the direction the waves are coming from using the protractor on the reverse side. 0 if calm.					<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>			<b>WAVE TYPE</b> <div style="display: flex; justify-content: space-between;"> <div>           0 - Calm            1 - Spilling            2 - Plunging         </div> <div>           3 - Surging            4 - Spill / Plunge         </div> </div>				<div style="border: 1px solid black; width: 20px; height: 20px;"></div>	
<b>WIND SPEED</b> Record wind speed to the nearest mph. If calm record 0.					<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>			<b>WIND DIRECTION</b> - Direction the wind is coming from 1 - N   3 - E   5 - S   7 - W   0 - Calm 2 - NE   4 - SE   6 - SW   8 - NW				<div style="border: 1px solid black; width: 20px; height: 20px;"></div>	
<b>FORESHORE SLOPE</b> Record foreshore slope to the nearest degree.					<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>			<b>WIDTH OF SURF ZONE</b> Estimate in feet the distance from shore to breakers, if calm record 0.				<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>	
<b>LONGSHORE CURRENT</b>					<b>DYE</b> Estimate distance in feet from shoreline to point of dye injection.								
<b>CURRENT SPEED</b> Measure in feet the distance the dye patch is observed to move during a one (1) minute period; if no longshore movement record 0.					<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>			<b>CURRENT DIRECTION</b> 0 No longshore movement + 1 Dye moves toward right - 1 Dye moves toward left				<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>	
<b>RIP CURRENTS</b> If rip currents are present, indicate spacing (feet). If spacing is irregular estimate average spacing. If no rips record 0.												<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>	
<b>BEACH CUSPS</b> If cusps are present, indicate spacing (feet). If spacing is irregular estimate average spacing. If no cusps record 0.												<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>	
<b>PLEASE PRINT:</b> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%; border-bottom: 1px solid black; text-align: center;">SITE NAME</div> <div style="width: 45%; border-bottom: 1px solid black; text-align: center;">OBSERVER</div> </div> <p style="text-align: center; margin-top: 10px;">Please Check The Form For Completeness</p> <p>REMARKS: _____</p> <p>_____</p> <p>_____</p>													
<div style="display: flex; justify-content: space-between; font-size: small;"> <div>CERC 113-72 8 Mar 72</div> <div>Make any additional remarks, computations or sketches on the reverse side of this form.</div> </div>													

## APPENDIX B

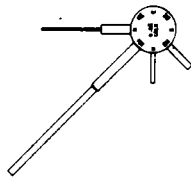
### LEO DATA SUMMARY FOR NORTHERN CALIFORNIA SITES

This appendix presents LEO data for the following 25 northern California sites located between Pelican Beach State Park and Sunset Beach (Monterey Bay):

	<u>Sites</u>	<u>Page No. in App.</u>
05310	Pelican Beach State Park	32
05313	Enderts Beach	34
05036	Prairie Creek Redwoods State Park	39
05307	Redwood Creek Beach	44
05306	Mad River	49
05302	Centerville Beach	55
05301	Shelter Cove	60
05026	MacKerricher Beach State Park	65
05025	Russian Gulch State Park	70
05024	Van Damme Beach State Park	75
05300	Navarro Beach	77
05023	Manchester Beach State Park	81
05020	Goat Rock Beach	86
05021	Wright's Beach	94
05355	Drake's Beach	102
05500	Bolinas Beach	104
05022	Stinson Beach State Park	109
05002	Thornton Beach State Park	117
05003	Francis Beach	122
05004	Natural Bridges State Park	127
05367	Capitola Beach State Park	132
05005	Twin Lakes State Park	137
05001	New Brighton Beach State Park	144
05006	Sea Cliff Beach	150
05007	Sunset Beach	157

5110 PELICAN CALIFORNIA SUMMARY FOR PERIOD STARTING 1-29-70 AND ENDING 12-8-70.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SUNF OBS.													
HEIGHT (FT)													
MEAN	5.00	15.00	12.00	3.00	4.00	4.00	3.00	3.00	2.00	3.00	0.00	3.00	5.18
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24
NO. OBS.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	0.	1.	11.
PERIOD (SEC)													
MEAN	10.00	12.00	11.00	10.20	8.30	9.70	7.80	8.20	10.10	18.10	0.00	9.20	10.20
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09
NO. OBS.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	0.	1.	11.
DIRECTION													
COASTAL SECTOR													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.	0.	1.	0.
COMPASS SECTOR													
OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
BREAKER TYPE													
TOCC SPILL	0.00	100.00	0.00	100.00	100.00	0.00	0.00	0.00	3.00	100.00	0.00	100.00	95.45
SP/PL	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	36.36
PLUNGE	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.18
BURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	0.	1.	11.
CURRENT OBS.													
(FT/SEC)													
MFT MEAN	.42	1.00	.65	0.00	-.95	0.00	-.35	.50	.98	0.00	0.00	0.00	.31
GROSS MEAN	.42	1.00	.65	0.00	-.95	0.00	.35	.50	.98	0.00	0.00	0.00	.57
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.57
NO. OBS.	1.	1.	1.	1.	1.	1.	1.	1.	1.	0.	0.	1.	10.
FORESHORE SLOPE													
MEAN (DEG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RIPS 3 OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	0.	1.	11.
CUSPS 3 OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	0.	1.	11.



INSUFFICIENT DATA

INSUFFICIENT DATA

INSUFFICIENT DATA

INSUFFICIENT DATA

INSUFFICIENT DATA  
APRIL

INSUFFICIENT DATA  
MARCH

INSUFFICIENT DATA  
FEBRUARY

INSUFFICIENT DATA  
JANUARY

ANNUAL AVERAGE

AUGUST

JULY

JUNE

MAY



DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
29 JAN 70 TO 08 DEC 70

INSUFFICIENT DATA

NO DATA

INSUFFICIENT DATA

INSUFFICIENT DATA

DECEMBER

NOVEMBER

OCTOBER

SEPTEMBER

SUMMARY FOR PERIOD STARTING 2-10-70 AND ENDING 7-9-72.

CALIFORNIA

SAN FRANCISCO BEACH

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	4.00	6.05	4.24	3.50	2.01	3.27	2.59	4.03	3.58	3.90	4.46	4.44	3.85
STD DEV	0.00	1.78	1.73	.01	.51	1.10	.05	3.90	1.09	.97	.97	.73	2.01
NO. OBS.	3.	19.	33.	26.	21.	11.	29.	31.	12.	21.	13.	9.	228.
PERIOD (SEC)													
MEAN	21.00	15.46	15.73	17.05	14.02	18.89	13.61	16.85	17.25	17.60	17.62	19.44	16.31
STD DEV	9.10	2.98	3.38	2.66	4.35	4.84	5.97	6.59	5.81	3.42	2.44	2.21	4.77
NO. OBS.	3.	19.	33.	26.	21.	11.	29.	31.	12.	21.	13.	9.	228.
DIRECTION													
COASTAL SECTOR													
0 OCC.	0.00	15.79	3.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
1	0.00	36.84	18.18	3.85	19.05	20.00	38.46	12.90	0.00	0.00	0.00	0.00	15.63
2	0.00	42.11	39.39	53.85	61.90	50.00	61.58	74.19	83.33	95.24	92.31	100.00	64.29
3	33.33	0.00	0.00	0.00	19.05	30.00	0.00	12.90	16.67	4.76	0.00	0.00	17.86
4	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	5.26	0.00	26.	21.	10.	26.	31.	12.	21.	13.	9.	224.
NO. OBS.	3.	19.	33.	26.	21.	10.	26.	31.	12.	21.	13.	9.	224.
BREAKER TYPE													
BOCC SPILL	0.00	0.00	57.58	19.23	42.86	63.64	51.72	38.71	33.33	61.90	92.31	100.00	46.05
SP/PL	100.00	52.63	42.42	73.08	92.30	9.09	34.08	29.03	41.67	0.00	0.00	0.00	35.96
PLUNGE	0.00	47.37	0.00	7.69	4.76	27.27	13.79	32.26	25.00	38.10	7.69	0.00	17.98
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	19.	33.	26.	21.	11.	29.	31.	12.	21.	13.	9.	228.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-0.04	-0.94	-0.79	0.11	-0.09	0.72	-0.87	-0.68	-0.49	-0.73	-0.70	-0.50	-0.55
GROSS MEAN	.29	1.27	1.00	.83	.77	.09	.71	.76	.91	.73	.70	.50	.64
STD DEV	.41	.75	.63	.56	.83	.79	.84	.89	.84	.26	.37	.38	.59
NO. OBS.	2.	18.	33.	26.	21.	10.	29.	31.	12.	21.	13.	8.	224.
FORESHORE SLOPE													
MEAN (DEC)	4.67	5.89	3.76	3.27	3.24	2.82	3.46	2.49	2.88	3.76	3.54	3.78	3.50
STD DEV	2.31	1.64	1.97	1.59	1.64	1.17	3.46	1.19	1.16	3.79	.70	.67	2.26
NO. OBS.	3.	18.	33.	26.	21.	11.	29.	31.	12.	21.	13.	9.	228.
RIPS & OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	19.	33.	26.	21.	11.	29.	31.	12.	21.	13.	9.	228.
CUSPS & OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	19.	33.	26.	21.	11.	29.	31.	12.	21.	13.	9.	228.

SUMMARY FOR PERIOD STARTING 2-10-70 AND ENDING 12-10-70.													
CALIFORNIA													
5313 PATENTS BEACH													
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF HWS.													
WEIGHT (FT)													
MEAN	0.00	0.17	0.17	3.50	2.01	3.33	3.70	3.50	4.00	4.14	4.07	4.44	0.03
STD DEV	0.00	1.76	1.75	.41	.51	1.22	.07	.78	.63	1.10	.65	.73	1.43
NO. OBS.	0.	1A.	20.	20.	21.	9.	10.	10.	6.	14.	12.	9.	172.
PERIOD (SEC)													
MEAN	0.00	15.02	15.71	17.05	14.02	20.64	21.10	21.94	22.58	19.06	16.13	19.44	17.06
STD DEV	0.00	2.97	3.55	2.06	4.35	2.00	2.40	3.09	1.72	1.03	1.46	2.21	3.95
NO. OBS.	0.	1A.	20.	20.	21.	9.	10.	10.	6.	14.	12.	9.	172.
DIRECTION													
COASTAL SECTOR													
OCC.	0.00	10.67	3.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36
1	0.00	3A.49	20.09	3.45	19.05	25.00	100.00	11.11	0.00	0.00	0.00	0.00	17.06
2	0.00	3A.49	37.93	53.45	61.90	37.50	0.00	72.22	60.67	92.46	91.67	100.00	58.33
3	0.00	0.00	37.93	42.31	19.05	37.50	0.00	16.67	33.33	7.14	0.00	0.00	20.83
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	5.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1A.	29.	20.	21.	0.	7.	18.	6.	14.	12.	9.	160.
BREAKER TYPE													
ZONC SPILL	0.00	0.00	5A.67	19.23	42.06	55.56	90.00	66.67	66.67	92.86	100.00	100.00	55.23
SP/PL	0.00	45.56	41.3A	73.08	52.3A	11.11	0.00	22.22	33.33	0.00	0.00	0.00	34.30
PLUNGE	0.00	44.44	0.00	7.49	4.76	33.33	10.00	11.11	0.00	7.14	0.00	0.00	10.47
SUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1A.	29.	20.	21.	9.	10.	18.	6.	14.	12.	9.	172.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	-0.08	-0.68	-0.11	-0.09	-0.50	-0.14	-0.60	-0.82	-0.77	-0.83	-0.50	-0.55
GROSS MEAN	0.00	1.32	1.02	.83	.77	.72	.52	.79	1.49	.77	.83	.58	.80
STD DEV	0.00	.69	.65	.56	.43	.75	.25	.44	.94	.35	.30	.38	.50
NO. OBS.	0.	17.	29.	20.	21.	6.	10.	18.	6.	14.	12.	9.	169.
FURROWSHIP SLOPE													
MEAN (D/G)	0.00	5.44	3.59	3.27	3.20	2.78	4.22	2.43	2.07	3.29	3.50	3.78	3.58
STD DEV	0.00	1.69	1.92	1.59	1.64	1.30	5.93	1.25	1.37	.61	.80	.67	2.00
NO. OBS.	0.	17.	29.	20.	21.	9.	9.	18.	6.	14.	12.	9.	170.
RIPS & OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1A.	29.	20.	21.	9.	10.	18.	6.	14.	12.	9.	172.
CUSPS & OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1A.	29.	20.	21.	9.	10.	18.	6.	14.	12.	9.	172.

# SUMMARY FOR PERIOD STARTING 1-18-71 AND ENDING 11-7-71.

## CALIFORNIA

## S313 ENDLIS BEACH

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	4.00	0.00	0.00	0.00	0.00	0.00	2.07	4.69	3.17	3.43	2.00	0.00	3.34
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	.27	6.16	.75	.98	0.00	0.00	3.46
NO. OBS.	3.	0.	0.	0.	0.	0.	18.	13.	6.	7.	1.	0.	44.
PERIOD (SEC)													
MEAN	21.00	0.00	0.00	0.00	0.00	0.00	9.63	9.81	11.92	13.07	11.50	0.00	11.36
STD DEV	9.10	0.00	0.00	0.00	0.00	0.00	2.00	1.51	1.72	.98	0.00	0.00	3.86
NO. OBS.	3.	0.	0.	0.	0.	0.	14.	13.	6.	7.	1.	0.	44.
DIRECTION													
COASTAL SECTOR													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	21.43	15.38	0.00	0.00	0.00	0.00	11.36
3	33.33	0.00	0.00	0.00	0.00	0.00	78.57	76.92	100.00	100.00	100.00	0.00	81.82
4	66.67	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	6.62
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	0.	0.	0.	0.	0.	14.	13.	6.	7.	1.	0.	44.
BREAKER TYPE													
XOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	2.27
SP/PL	100.00	0.00	0.00	0.00	0.00	0.00	71.43	38.46	50.00	0.00	0.00	0.00	47.73
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	21.43	61.54	50.00	100.00	100.00	0.00	50.00
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	0.	0.	0.	0.	0.	14.	13.	6.	7.	1.	0.	44.
CURRENT OBS.													
(FI/SEC)													
NET MEAN	-0.04	0.00	0.00	0.00	0.00	0.00	-0.87	-0.72	-0.16	-0.66	-0.08	0.00	-0.63
GROSS MEAN	.29	0.00	0.00	0.00	0.00	0.00	1.09	.72	.33	.66	.08	0.00	.74
STD DEV	.41	0.00	0.00	0.00	0.00	0.00	.68	.77	.42	.40	0.00	0.00	.62
NO. OBS.	2.	0.	0.	0.	0.	0.	14.	13.	6.	7.	1.	0.	43.
FORESHORE SLOPE													
MEAN (DEG)	4.67	0.00	0.00	0.00	0.00	0.00	3.21	1.92	2.50	4.71	4.00	0.00	3.09
STD DEV	2.31	0.00	0.00	0.00	0.00	0.00	1.56	.76	1.05	6.75	0.00	0.00	2.96

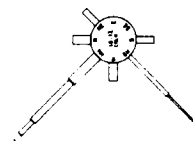
# 5315 ENDERTS REACH CALIFORNIA SUMMARY FOR PERIOD STARTING 2- 9-72 AND ENDING 7- 9-72.

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	0.00	4.00	4.75	0.00	0.00	3.00	1.60	0.00	0.00	0.00	0.00	0.00	3.17
STD DEV	0.00	0.00	1.71	0.00	0.00	0.00	.45	0.00	0.00	0.00	0.00	0.00	1.64
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.
PERIOD (SEC)													
MEAN	0.00	12.50	15.66	0.00	0.00	11.00	9.60	0.00	0.00	0.00	0.00	0.00	12.25
STD DEV	0.00	0.00	2.02	0.00	0.00	4.95	3.05	0.00	0.00	0.00	0.00	0.00	3.61
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.
DIRECTION													
COASTAL SECTOR													
0 DEG.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	100.00	50.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	63.33
4	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.
BREAKER TYPE													
ROCK SPILL	0.00	0.00	50.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	75.00
SP/PL	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	-0.02	-0.09	0.00	0.00	-1.50	0.00	0.00	0.00	0.00	0.00	0.00	-0.33
GROSS MEAN	0.00	-0.02	-0.03	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	-0.57
STD DEV	0.00	0.00	.50	0.00	0.00	.70	0.00	0.00	0.00	0.00	0.00	0.00	.63
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.
FORESHORE SLOPE													
MEAN (DEG)	0.00	6.00	5.00	0.00	0.00	3.00	2.60	0.00	0.00	0.00	0.00	0.00	3.63
STD DEV	0.00	0.00	2.16	0.00	0.00	0.00	.45	0.00	0.00	0.00	0.00	0.00	1.70
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.
RIPS X UCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.
CUSPS X OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	1.	4.	0.	0.	2.	5.	0.	0.	0.	0.	0.	12.



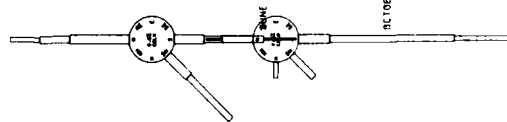
# CALIFORNIA

## WIND ROSES 5313 ENDERTS BEACH

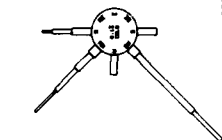


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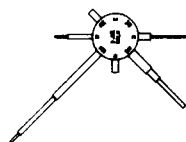
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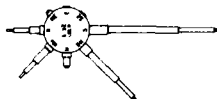
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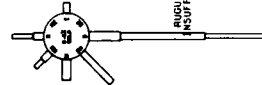


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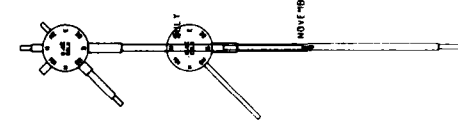


ANNUAL AVERAGE

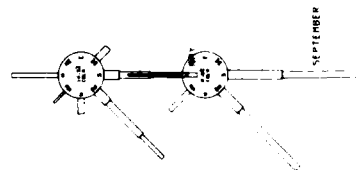
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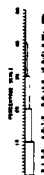
DECEMBER



NOVEMBER



SEPTEMBER



DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
11 FEB 70 TO 09 JUL 72



# SONA PARADISE CHIEF RECORDS CALIFORNIA SUMMARY FOR PERIOD STARTING 4-24-68 AND ENDING 12-29-68.

SURF DIRS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
WEIGHT (FT)													
MEAN	0.00	0.00	0.00	1.83	3.28	2.67	2.60	2.75	3.08	3.75	5.15	4.50	3.33
STD DEV	0.00	0.00	0.00	1.33	1.16	.96	.76	1.06	1.83	1.85	2.21	.85	1.54
NO. OBS.	0.	0.	0.	6.	29.	30.	50.	44.	32.	24.	20.	14.	249.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	11.17	9.89	10.08	9.97	10.49	9.50	10.59	10.62	10.53	10.15
STD DEV	0.00	0.00	0.00	1.33	1.82	2.22	3.06	2.72	1.83	3.13	1.84	1.59	2.45
NO. OBS.	0.	0.	0.	6.	29.	29.	49.	43.	32.	24.	20.	14.	246.
DIRECTION													
COMPASS SECTOR													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 OCC. NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	3.83	0.00	4.65	0.00	0.00	0.00	0.00	1.23
SW	0.00	0.00	0.00	0.00	6.90	0.00	0.00	2.33	0.00	0.00	5.56	7.69	3.28
W	0.00	0.00	0.00	100.00	93.10	96.67	91.84	86.37	84.38	91.67	94.44	38.46	88.52
NW	0.00	0.00	0.00	0.00	0.00	0.00	2.04	4.65	15.63	8.33	0.00	53.85	6.97
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	6.	29.	30.	49.	43.	32.	24.	18.	13.	244.
BREAKER TYPE													
BOCC SPILL	0.00	0.00	0.00	81.33	93.10	100.00	97.96	90.91	87.10	83.33	57.89	92.31	89.80
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	16.87	6.90	0.00	2.04	9.09	12.90	16.87	42.11	7.69	10.20
SUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	6.	29.	30.	49.	44.	31.	24.	19.	13.	245.
CURRENT DIRS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	-1.08	0.01	0.42	-0.83	-1.12	0.95	-0.59	-1.17	-0.43	0.68
GROSS MEAN	0.00	0.00	0.00	1.14	0.94	1.01	0.90	1.33	1.00	0.93	1.24	0.43	1.00
STD DEV	0.00	0.00	0.00	1.41	1.27	0.70	0.67	0.88	0.91	0.59	0.87	0.30	0.86
NO. OBS.	0.	0.	0.	6.	29.	23.	29.	24.	27.	23.	17.	11.	189.
FOREROWF SLOPE													
MEAN (DEC)	0.00	0.00	0.00	9.67	7.04	3.65	3.85	7.27	7.71	7.17	5.44	7.83	6.33
STD DEV	0.00	0.00	0.00	2.34	2.96	2.41	1.59	1.83	2.09	4.17	1.69	3.13	3.04
NO. OBS.	0.	0.	0.	6.	28.	20.	27.	22.	28.	23.	18.	12.	184.
RIPS % OCC	0.00	0.00	0.00	20.00	10.34	0.00	2.00	0.00	0.00	8.33	40.00	21.43	7.26
MEAN SPAC.	0.00	0.00	0.00	300.00	200.00	0.00	270.00	0.00	0.00	125.00	318.75	381.33	163.88
NO. OBS.	0.	0.	0.	5.	29.	30.	50.	44.	32.	24.	20.	14.	246.
CUSP % OCC	0.00	0.00	0.00	100.00	96.35	66.67	84.00	36.36	20.83	79.17	0.00	0.00	48.13
MEAN SPAC.	0.00	0.00	0.00	121.33	202.89	277.20	262.36	207.56	220.40	160.95	0.00	0.00	185.16
NO. OBS.	0.	0.	0.	6.	29.	30.	50.	44.	24.	24.	20.	14.	241.

SAN PABLO CHALK MENDOCINO CALIFORNIA SUMMARY FOR PERIOD STARTING 1-4-69 AND ENDING 12-31-69.

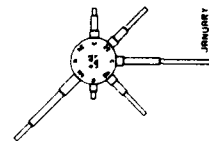
SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	6.43	7.60	6.21	5.64	4.27	2.53	2.55	2.26	3.21	3.48	3.86	5.42	4.17
STD DEV	2.34	2.10	2.13	1.91	1.74	1.04	.57	.53	1.13	1.18	.85	1.72	2.12
NO. OBS.	14.	15.	24.	25.	30.	30.	29.	27.	28.	29.	28.	26.	305.
PERIOD (SEC)													
MEAN	11.76	12.37	12.79	13.28	12.42	9.05	8.05	7.97	9.13	9.40	10.51	13.72	10.71
STD DEV	1.33	1.44	1.52	2.32	2.56	2.70	3.03	1.57	3.15	2.26	2.14	2.50	3.09
NO. OBS.	14.	15.	24.	25.	30.	29.	29.	26.	28.	29.	28.	26.	303.
DIRECTION													
COMPASS SECTION													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	14.	15.	23.	25.	30.	28.	29.	27.	28.	29.	28.	26.	302.
BREAKER TYPE													
ROCC SPILL	AS.71	100.00	95.83	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.01
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SURGE	10.29	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.99
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	14.	15.	24.	25.	30.	29.	29.	27.	28.	29.	28.	26.	304.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-55	.95	.33	-.36	.28	-1.46	-2.77	-2.45	-1.42	-.24	-1.55	.50	-.81
GROSS MEAN	1.90	1.20	1.03	.66	.95	1.71	2.84	2.49	1.51	.79	1.73	.91	1.49
STD DEV	1.12	.80	.66	.89	1.20	1.25	1.18	1.14	1.76	.56	1.15	1.29	1.30
NO. OBS.	14.	15.	24.	24.	27.	30.	29.	27.	28.	29.	28.	26.	299.
FORESHORE SLOPE													
MEAN (DEG)	5.64	5.93	7.04	5.20	5.00	7.03	6.64	6.65	3.70	4.32	5.11	5.08	5.59
STD DEV	1.45	1.91	1.65	2.22	2.07	2.51	1.16	2.21	3.73	1.70	1.95	1.72	2.37
NO. OBS.	14.	15.	24.	25.	29.	29.	28.	26.	27.	28.	27.	26.	298.
RIPS & OCC	21.43	0.00	4.17	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	1.97
MEAN SPAC.	233.33	0.00	200.00	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	200.00	42.51
NO. OBS.	14.	15.	24.	25.	30.	30.	29.	27.	28.	29.	28.	26.	305.
CUSPS & OCC.	50.00	73.33	79.17	64.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.66
MEAN SPAC.	150.00	137.91	190.32	230.31	279.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.38
NO. OBS.	14.	15.	24.	25.	30.	30.	29.	27.	28.	29.	28.	26.	305.

# SUMMARY FOR PERIOD STARTING 1-1-70 AND ENDING 12-28-70.

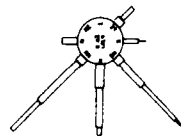
## 5016 PRAIRIE CREEK REEF-IONS CALIFORNIA

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)	1.05	4.15	3.78	2.40	3.17	3.23	3.13	2.44	2.40	3.04	3.80	4.49	3.40
MEAN	1.12	1.35	1.45	.82	1.07	.91	.95	1.22	1.03	.91	1.01	.68	1.19
STD DEV	31.	27.	27.	25.	24.	26.	24.	17.	30.	24.	20.	18.	298.
NO. OBS.													
<b>PERIOD (SEC)</b>													
MEAN	13.44	10.74	13.12	12.15	10.23	9.45	9.14	9.16	9.51	9.02	10.74	10.69	10.99
STD DEV	2.69	2.15	2.31	1.94	2.86	2.21	1.46	1.78	1.94	1.63	2.98	2.21	2.84
NO. OBS.	31.	27.	27.	25.	29.	26.	24.	17.	30.	24.	20.	18.	298.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
W. OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	17.	17.	30.	24.	20.	18.	126.
<b>COMPASS SECTOR</b>													
W. OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	32.26	18.52	7.41	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	67.74	81.48	81.48	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	31.	27.	27.	25.	29.	26.	7.	0.	0.	0.	0.	0.	172.
<b>MEANER TYPE</b>													
SOCC SPILL	96.77	100.00	100.00	100.00	100.00	100.00	75.00	58.82	23.33	0.00	0.00	22.22	46.12
SP/APL	0.00	0.00	0.00	0.00	0.00	0.00	20.33	28.41	63.33	95.83	100.00	77.76	28.86
PLUNGE	3.23	0.00	0.00	0.00	0.00	0.00	4.17	5.88	6.67	4.17	0.00	0.00	0.00
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	6.67	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	31.	27.	27.	25.	29.	26.	24.	17.	30.	24.	20.	18.	298.
<b>CURRENT OBS.</b>													
(PT/SEC)													
NET MEAN	.61	-.04	-.07	-.74	-.81	-.38	-.60	-.66	-1.66	-.84	1.02	.60	-.36
GROSS MEAN	.69	.52	.89	.80	.84	.48	.60	.60	1.72	1.62	1.56	1.08	.97
STD DEV	.70	.56	.93	.54	.57	.61	.50	.68	1.06	1.21	.94	.37	.83
NO. OBS.	22.	21.	20.	17.	24.	25.	24.	17.	24.	24.	20.	15.	259.
<b>FURROWS SLOPE</b>													
MEAN (DEC)	6.45	4.31	4.59	7.60	6.25	9.75	5.54	6.24	7.79	4.00	3.70	4.22	6.35
STD DEV	2.86	.61	.93	2.42	4.20	4.52	2.41	2.66	4.07	1.06	.80	.65	3.49
NO. OBS.	22.	13.	27.	25.	28.	24.	24.	17.	28.	24.	20.	18.	270.
<b>RIPS</b>													
% OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	31.	27.	27.	25.	29.	24.	24.	17.	30.	24.	20.	18.	298.
<b>CUSPS</b>													
% OCC	0.00	0.00	0.00	0.00	0.00	0.00	66.67	5.88	3.33	4.17	0.00	0.00	6.36
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	135.31	105.00	70.00	125.00	0.00	0.00	14.00
NO. OBS.	31.	27.	27.	25.	24.	26.	24.	17.	30.	24.	20.	18.	298.

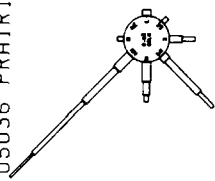
# WIND ROSES 05036 PRAIRIE CREEK REDWOODS CALIFORNIA



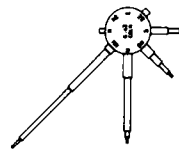
JANUARY



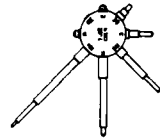
FEBRUARY



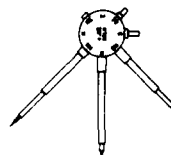
MARCH



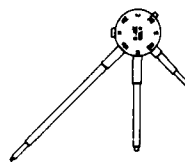
APRIL



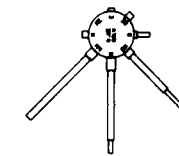
MAY



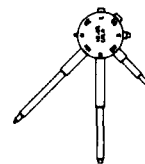
JUNE



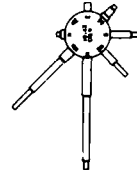
JULY



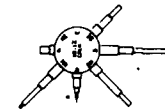
AUGUST



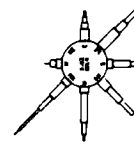
SEPTEMBER



OCTOBER



NOVEMBER



DECEMBER

ANNUAL AVERAGE



DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
24 APR 68 TO 28 DEC 70

5307 RED-ROCK CREEK CALIFORNIA SUMMARY FOR PERIOD STARTING 2-1-70 AND ENDING 7-12-72.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	10.00	4.07	6.32	6.00	6.33	6.13	5.83	4.39	6.64	9.63	6.67	13.50	6.18
STD DEV	0.00	.92	1.70	1.65	1.67	1.55	1.56	1.75	1.78	1.59	2.31	7.12	2.46
NO. OBS.	1.	15.	22.	20.	12.	8.	35.	28.	14.	16.	3.	2.	176.
PERIOD (SEC)													
MEAN	12.00	16.01	16.39	14.65	12.71	19.00	18.71	14.69	15.15	12.22	10.50	12.00	15.51
STD DEV	0.00	3.23	4.27	2.94	1.70	5.07	4.19	5.01	5.81	2.31	0.00	0.00	4.42
NO. OBS.	1.	15.	22.	20.	12.	5.	32.	26.	11.	16.	3.	2.	165.
DIRECTION													
COASTAL SECTOR													
OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00	1.18
2	0.00	60.00	45.45	60.00	30.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	26.62
3	100.00	10.00	0.00	30.00	33.33	50.00	74.89	57.14	57.14	60.00	100.00	100.00	47.08
4	0.00	10.00	4.55	10.00	16.67	25.00	25.71	42.86	35.71	26.67	0.00	0.00	22.35
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	3.9
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	10.	22.	20.	12.	8.	35.	28.	14.	15.	3.	2.	170.
COMPASS SECTOR													
OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5.
BREAKER TYPE													
SOCC SPILL	0.00	6.67	4.55	5.00	8.33	0.00	14.29	17.00	0.00	0.00	0.00	0.00	7.95
SP/PL	0.00	0.00	0.00	0.00	0.00	12.50	5.71	7.14	0.00	0.00	0.00	0.00	2.84
PLUNGE	100.00	93.33	95.45	95.00	91.67	87.50	80.00	75.00	100.00	100.00	100.00	100.00	89.20
BURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	15.	22.	20.	12.	8.	35.	28.	14.	16.	3.	2.	176.
CURRENT OBS.													
(F/T/SEC)													
MEAN	-2.90	1.04	-0.70	-0.92	-1.61	-0.92	-0.86	-0.78	-0.32	-0.83	-0.13	-2.45	-0.73
STD DEV	2.90	1.33	1.63	1.27	1.87	1.12	0.79	0.78	1.32	1.09	0.76	2.45	1.29
NO. OBS.	1.	15.	22.	20.	12.	8.	35.	28.	14.	16.	3.	2.	176.
FORESHORE SLOPE													
MEAN (DEG)	7.00	7.13	6.91	5.65	7.50	9.00	8.29	8.39	8.07	7.56	6.00	10.00	7.60
STD DEV	0.00	0.92	1.54	1.14	1.45	3.07	1.64	2.17	2.44	1.97	0.00	0.00	2.27
NO. OBS.	1.	15.	22.	20.	12.	8.	35.	28.	14.	16.	3.	2.	176.
RIPS % OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	15.	22.	20.	12.	8.	35.	28.	14.	16.	3.	2.	176.
CUSPS % OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	15.	22.	20.	12.	8.	35.	28.	14.	16.	3.	2.	176.

CALIFORNIA													SUMMARY FOR PERIOD STARTING 2- 1-70 AND ENDING 11- 1-70.									
SNOT RECORD CHIEF																						
SURF HWS.		JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.								
HEIGHT (FT)																						
MEAN	0.00	4.00	6.33	6.00	6.59	5.86	5.86	6.04	4.00	7.50	10.00	6.00	0.00	0.41								
STD DEV	0.00	.97	1.70	1.70	1.57	1.46	1.46	1.31	.82	1.41	3.73	0.00	0.00	2.32								
NO. OBS.	0.	13.	21.	19.	11.	7.	7.	25.	4.	8.	13.	1.	0.	122.								
PERIOD (SEC)																						
MEAN	0.00	16.85	16.00	14.86	12.77	20.63	20.63	19.58	25.50	20.42	12.15	10.50	0.00	16.44								
STD DEV	0.00	3.19	4.26	2.85	1.77	4.09	4.09	3.89	6.16	3.32	2.55	0.00	0.00	4.44								
NO. OBS.	0.	13.	21.	19.	11.	4.	4.	22.	2.	5.	13.	1.	0.	111.								
DIRECTION																						
COASTAL SECTOR																						
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72								
2	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.24								
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.38								
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.79								
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.66								
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
NO. OBS.	0.	4.	21.	19.	11.	7.	7.	25.	4.	8.	12.	1.	0.	116.								
COMPASS SECTOR																						
OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
SW	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00								
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
NO. OBS.	0.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5.								
BREAKER TYPE																						
30CC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
PLUNGE	0.00	100.00	0.00	0.00	0.00	0.00	14.29	8.00	50.00	0.00	0.00	0.00	0.00	4.10								
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	85.71	92.00	50.00	100.00	100.00	100.00	0.00	95.40								
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
NO. OBS.	0.	13.	21.	19.	11.	7.	7.	25.	4.	8.	13.	1.	0.	122.								
CURRENT HWS.																						
(FT/SEC)																						
MEAN	0.00	1.34	0.84	-1.03	-1.84	0.89	0.89	0.36	0.81	-1.80	0.67	0.45	0.00	0.67								
STD DEV	0.00	1.54	1.58	1.28	1.95	1.13	1.13	0.67	.81	1.80	1.49	.45	0.00	1.33								
NO. OBS.	0.	13.	21.	19.	11.	7.	7.	25.	4.	8.	13.	1.	0.	122.								
FORESHORE SLOPE																						
MEAN (DEG)	0.00	7.15	7.00	5.58	7.64	8.29	8.29	8.00	8.75	9.50	7.92	6.00	0.00	7.44								
STD DEV	0.00	1.90	1.52	1.12	1.44	2.50	2.50	1.35	2.36	5.71	1.85	0.00	0.00	2.22								
NO. OBS.	0.	13.	21.	19.	11.	7.	7.	25.	4.	8.	13.	1.	0.	122.								
WIPS & HCC																						
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
NO. OBS.	0.	13.	21.	19.	11.	7.	7.	25.	4.	8.	13.	1.	0.	122.								
CUSPS & HCC																						
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
NO. OBS.	0.	13.	21.	19.	11.	7.	7.	25.	4.	8.	13.	1.	0.	122.								



# 5307 REDWOOD CREEK CALIFORNIA SUMMARY FOR PERIOD STARTING 7-21-71 AND ENDING 12-19-71.

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	4.08	4.46	5.50	7.67	10.00	13.50	5.53
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	1.86	1.86	1.64	2.52	0.00	2.12	2.77
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	17.25	13.79	11.13	12.50	10.50	12.00	13.74
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	5.04	3.41	1.61	.87	0.00	0.00	3.98
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.
DIRECTION													
COASTAL SECTOR													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	62.50	50.00	100.00	33.33	100.00	100.00	62.22
4	0.00	0.00	0.00	0.00	0.00	0.00	37.50	50.00	0.00	66.67	0.00	0.00	37.78
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.
WRECKER TYPE													
BOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	37.50	20.43	0.00	0.00	0.00	0.00	17.78
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLINGE	0.00	0.00	0.00	0.00	0.00	0.00	62.50	79.17	100.00	100.00	100.00	100.00	82.22
Surge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.
CURRENT OBS.													
(FT/SEC)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	-1.13	-1.78	-1.68	-1.52	.42	-2.45	-1.90
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	1.13	.78	.68	1.52	.92	2.45	.96
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.
FORESHORT SLOPE													
MEAN (NEG)	0.00	0.00	0.00	0.00	0.00	0.00	8.75	6.33	6.17	6.00	6.00	10.00	7.93
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	1.75	2.18	1.83	2.00	0.00	0.00	2.19
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.
RIPS & UCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.
CUSP & OCC.													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	8.	24.	6.	3.	2.	2.	45.

5307 RED-ROCK CREEK		CALIFORNIA												SUMMARY FOR PERIOD STARTING 1- 3-72 AND ENDING 7-12-72.											
		JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.											
SURF OBS.																									
WRIGHT (FT)																									
MEAN		10.00	4.50	6.00	6.00	4.00	8.00	7.00	0.00	0.00	0.00	0.00	0.00												
STD DEV		0.00	.71	0.00	0.00	0.00	0.00	4.24	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												
PERIOD (SEC)																									
MEAN		12.00	13.50	12.00	10.50	12.00	12.50	15.00	0.00	0.00	0.00	0.00	0.00												
STD DEV		0.00	2.12	0.00	0.00	0.00	0.00	4.24	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												
DIRECTION																									
COASTAL SECTOR																									
N OCC.		1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
3		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
4		100.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
5		0.00	50.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00												
CALM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												
BREAKER TYPE																									
BOCC SPILL		0.00	50.00	100.00	100.00	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00												
SP/PL		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
PLUNGE		100.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
SURGE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
CALM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												
CURRENT OBS.																									
(FT/SFC)																									
MFT MEAN		-2.90	-1.21	2.60	1.20	-1.00	-1.10	-0.74	0.00	0.00	0.00	0.00	0.00												
GROSS MEAN		2.90	1.21	2.60	1.20	1.00	1.10	.74	0.00	0.00	0.00	0.00	0.00												
STD DEV		0.00	1.76	0.00	0.00	0.00	0.00	.77	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												
FURROWS SLOPE																									
MEAN (DEG)		7.00	7.00	5.00	7.00	6.00	14.00	10.00	0.00	0.00	0.00	0.00	0.00												
STD DEV		0.00	1.41	0.00	0.00	0.00	0.00	4.24	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												
RIPS & UCC																									
MEAN SPAC.		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												
CUSPS & OCC.																									
MEAN SPAC.		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
NO. OBS.		1.	2.	1.	1.	1.	1.	2.	0.	0.	0.	0.	0.												

WIND ROSES FOR 05307--REDWOOD CREEK  
(not available)

## SUMMARY FOR PERIOD STARTING 11- 7-69 AND ENDING 5-14-72.

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SUMMARY FOR PERIOD STARTING 11- 7-69 AND ENDING 12-26-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
Wt GWT (FT)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.50	7.71	7.16
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.26	3.02	2.72
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	17.	31.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.20	2.20
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
DIRECTION													
COMPASS SECTOR													
O OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	23.53	12.90
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.47	87.10
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	17.	31.
WEATHER TYPE													
XUCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.71	76.47	80.65
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	23.53	19.35
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	17.	31.
CURRENT OBS.													
(FT/SEC)													
NET MEAN.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.48	.47	.48
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.89	1.16	1.04
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.56	.79	.64
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	17.	31.
FORESHORE SLOPE													
MEAN (DEG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	17.	25.
RIPS & OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	64.71	40.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	750.00	859.09	811.02
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	13.	17.	30.
CUSPS & OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	17.	31.



SUMMARY FOR PERIOD STARTING 1-3-71 AND ENDING 1-3-71.

ALL OBS.

NOV DEC

UCT

SEPT

AUG

JULY

JUNE

MAY

APRIL

MARCH

FEB

JAN

CALIFORNIA

5300 MAD RIVER

SURF OBS.

HEIGHT (FT)

MEAN

STD DEV

NO. OBS.

PERIOD (SEC)

MEAN

STD DEV

NO. OBS.

DIRECTION

COASTAL SECTOR

UCC. 1

2

3

4

5

CALM

NO. OBS.

WATERS TYPE

TOCC SPILL

SP/PL

PLUNGE

SURGE

CALM

NO. OBS.

CURRENT OBS.

(FT/SEC)

NET MEAN

GROSS MEAN

STD DEV

NO. OBS.

FURUSHINE SLOPE

MEAN (DEG)

STD DEV

NO. OBS.

RIPS & UCC

MEAN SPAC.

NO. OBS.

CUSPS & OCC.

MEAN SPAC.

NO. OBS.

# SUMMARY FOR PERIOD STARTING 1- 7-72 AND ENDING 5-14-72.

## CALIFORNIA

### SIOA MARIN RIVER

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WFLIGHT (FT)													
MEAN	3.75	5.33	3.33	4.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.21
STD DEV	1.26	1.53	2.08	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53
NO. OBS.	4.	3.	3.	3.	1.	0.	0.	0.	0.	0.	0.	0.	14.
PERIOD (SEC)													
MEAN	14.60	11.33	10.87	11.67	14.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.51
STD DEV	2.26	2.84	6.09	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.43
NO. OBS.	4.	3.	3.	3.	1.	0.	0.	0.	0.	0.	0.	0.	14.
DIRECTION													
COASTAL SECTOR													
NOCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOCC. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOCC. 3	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
NOCC. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOCC. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	4.	3.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	13.
BREAKER TYPE													
NOCC SPILL	50.00	33.33	66.67	100.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00
SP/PL	25.00	66.67	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.67
PLUNGE	25.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	4.	3.	3.	3.	2.	0.	0.	0.	0.	0.	0.	0.	13.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	.03	-.94	-.43	-.85	-.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-.49
GROSS MEAN	1.12	.83	.65	.85	.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.85
STD DEV	.97	.69	.80	.71	.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.47
NO. OBS.	4.	3.	3.	3.	2.	0.	0.	0.	0.	0.	0.	0.	15.
FURFISHNET SLOPE													
MEAN (NEG)	4.33	4.33	2.00	4.50	4.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
STD DEV	1.15	2.08	1.00	2.12	.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63
NO. OBS.	3.	3.	3.	2.	2.	0.	0.	0.	0.	0.	0.	0.	13.
RIPS													
NOCC	50.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00
MEAN SPAC.	143.50	0.00	90.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.27
NO. OBS.	4.	3.	3.	3.	2.	0.	0.	0.	0.	0.	0.	0.	15.
CUSPS													
NOCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	4.	3.	3.	3.	2.	0.	0.	0.	0.	0.	0.	0.	15.



# WIND ROSES 5306 MAD RIVER CALIFORNIA

INSUFFICIENT DATA

NO DATA

INSUFFICIENT DATA

MAY

NO DATA

SEPTEMBER

INSUFFICIENT DATA

FEEDBACK

INSUFFICIENT DATA

JUNE

INSUFFICIENT DATA

OCTOBER

INSUFFICIENT DATA

MARCH

INSUFFICIENT DATA

JULY

NOVEMBER

INSUFFICIENT DATA

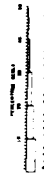
APRIL

INSUFFICIENT DATA

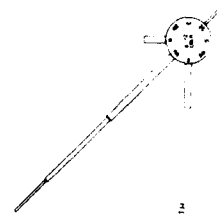
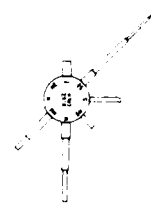
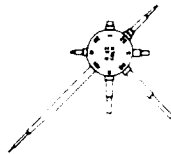
AUGUST

DECEMBER

ANNUAL AVERAGE



DATA BASED ON OBSERVATION  
PERIOD: 1961-1962  
NO. OF HOURS: 744



# 5302 CENTREVILLE RCH CALIFORNIA SUMMARY FOR PERIOD STARTING 11-5-69 AND ENDING 1-13-71.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)	5.00	6.00	5.00	3.50	4.00	0.00	0.00	4.30	4.67	5.00	7.57	8.00	5.07
MEAN	2.18	1.00	2.03	.71	0.00	0.00	0.00	1.51	1.50	0.00	3.72	3.77	2.95
STD DEV	0.	3.	2.	2.	1.	0.	0.	0.	12.	1.	14.	9.	61.
NO. OBS.													
<b>PERIOD (SEC)</b>													
MEAN	15.61	14.63	17.50	17.50	13.00	0.00	0.00	17.19	13.89	20.70	10.11	10.94	16.08
STD DEV	2.09	1.44	4.24	3.54	0.00	0.00	0.00	3.84	3.49	0.00	1.50	1.96	3.07
NO. OBS.	0.	1.	2.	2.	1.	0.	0.	0.	12.	1.	14.	9.	61.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
W OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	0.	0.	2.	1.	0.	0.	0.	12.	1.	0.	5.	32.
<b>COMPASS SECTOR</b>													
W OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	33.33	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.43	100.00	82.76
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	3.	2.	0.	0.	0.	0.	0.	0.	0.	14.	4.	29.
<b>BREAKER TYPE</b>													
SOCC SPILL	33.33	100.00	50.00	0.00	0.00	0.00	0.00	37.50	25.00	0.00	37.14	33.33	40.00
SP/PL	0.00	0.00	0.00	50.00	0.00	0.00	0.00	25.00	41.67	0.00	0.00	11.11	15.00
PLUNGE	66.67	0.00	0.00	50.00	100.00	0.00	0.00	37.50	33.33	0.00	42.86	55.56	45.00
BURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	3.	2.	2.	1.	0.	0.	0.	12.	0.	14.	9.	60.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	.59	1.09	0.00	-.20	0.00	0.00	0.00	-.10	-.94	0.00	-.88	-2.04	-.46
GROSS MEAN	1.22	1.09	0.00	-.20	0.00	0.00	0.00	1.20	1.14	3.12	1.71	2.29	1.45
STD DEV	1.53	.84	0.00	0.00	0.00	0.00	0.00	1.10	1.01	0.00	.93	2.02	1.13
NO. OBS.	4.	3.	0.	1.	0.	0.	0.	7.	9.	1.	10.	4.	39.
<b>FORESHORE SLOPE</b>													
MEAN (OBS)	9.67	0.00	0.00	7.50	0.00	0.00	0.00	9.75	10.00	11.00	0.00	13.60	10.35
STD DEV	.56	0.00	0.00	.71	0.00	0.00	0.00	3.24	3.00	0.00	0.00	2.70	3.22
NO. OBS.	3.	0.	0.	2.	0.	0.	0.	0.	12.	1.	0.	5.	31.
<b>RIPS</b>													
% OCC	11.11	0.00	0.00	0.00	0.00	0.00	0.00	37.50	8.33	0.00	0.00	0.00	8.20
MEAN SPAC.	400.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	337.00	0.00	0.00	0.00	100.20
NO. OBS.	0.	3.	2.	2.	1.	0.	0.	0.	12.	1.	14.	9.	61.
<b>CURBS</b>													
% OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	50.00	0.00	0.00	0.00	13.11
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.50	137.07	0.00	0.00	0.00	39.40
NO. OBS.	0.	1.	2.	2.	1.	0.	0.	0.	12.	1.	14.	9.	61.

# 5302 CENTERVILLE PCM CALIFORNIA SUMMARY FOR PERIOD STARTING 11-5-69 AND ENDING 12-8-69.

		JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.														
HEIGHT (FT)														
MEAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.57	10.50	0.22
STD DEV		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.72	6.51	3.96
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	4.	18.
PERIOD (SEC)														
MEAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.11	15.40	17.51
STD DEV		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	7.97	2.15
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	4.	18.
DIRECTION														
COMPASS SECTOR														
0 OCC. N		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	5.56
W		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	5.56
NW		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.43	0.00	77.78
CALM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	11.11
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	4.	0.00
												14.	4.	18.
BREAKER TYPE														
KNCC SPILL		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	57.14	75.00	61.11
SP/PL		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.86	25.00	38.89
SURGE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	4.	18.
CURRENT OBS.														
(FT/SEC)														
NET MEAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.68	.50	-0.75
GROSS MEAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71	.50	1.60
STD DEV		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.93	0.00	.93
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	10.	1.	11.
FORESHORE SLOPE														
MEAN (DEG)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1
STD DEV		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RIPS														
MEAN SPAC.		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	4.	18.
CUSPS														
MEAN SPAC.		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.	4.	18.

SUMMARY FOR PERIOD STARTING 1-15-70 AND ENDING 12-29-70.

[illegible]

5302 CENIERVILLE RMH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 5-71 AND ENDING 1-13-71.

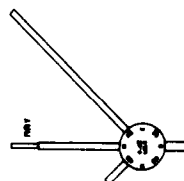
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	3.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.67
STD DEV	.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.58
NO. OBS.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
PERIOD (SFC)													
MEAN	15.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.17
STD DEV	3.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.06
NO. OBS.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
DIRECTION													
COASTAL SECTOR													
0 UCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33
3	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33
4	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
BREAKER TYPE													
WOLC SPILL	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.67
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	3.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.02
GROSS MEAN	3.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.02
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
FOR SHORE SLOPE													
MEAN (DEC)	9.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.67
STD DEV	.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.58
NO. OBS.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
RIPS X UCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
CUSPS X UCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.

# WIND ROSES 5302 CENTERVILLE BEACH CALIFORNIA

INSUFFICIENT DATA

JANUARY

INSUFFICIENT DATA



SEPTEMBER

INSUFFICIENT DATA

FEBRUARY

NO DATA

JUNE

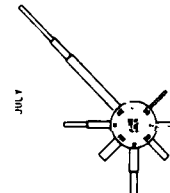
INSUFFICIENT DATA

OCTOBER

INSUFFICIENT DATA

MARCH

NO DATA



NOVEMBER

INSUFFICIENT DATA

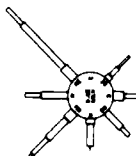
APRIL

INSUFFICIENT DATA

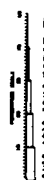
AUGUST

INSUFFICIENT DATA

DECEMBER



ANNUAL AVERAGE



DATA BASED ON OBSERVATIONS  
COLLECTED DURING PERIOD  
05 MAY 65 TO 13 JUN 71

5301 SHELTER COVE		CALIFORNIA												SUMMARY FOR PERIOD STARTING 2-20-69 AND ENDING 7-13-71.											
		JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.											
SURF OBS.																									
HEIGHT (FT)																									
MEAN		3.29	3.20	2.24	2.00	2.05	1.65	1.35	1.60	3.05	2.55	3.19	2.90	2.33											
STD DEV		2.35	1.63	1.39	1.26	1.04	.94	.93	1.04	1.75	1.37	1.31	1.73	1.49											
NO. OBS.		24.	38.	53.	52.	59.	57.	54.	42.	40.	38.	32.	21.	510.											
PERIOD (SEC)																									
MEAN		10.54	11.96	14.04	12.01	11.76	11.96	9.41	11.66	12.46	11.36	11.25	11.76	11.74											
STD DEV		3.63	2.55	3.43	2.28	3.25	3.40	2.96	3.27	2.52	3.10	2.81	2.61	3.19											
NO. OBS.		23.	38.	53.	52.	59.	56.	54.	42.	40.	38.	32.	21.	508.											
DIRECTION																									
CHASTAL SECTOR																									
a. OCC. 1		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
2		0.00	0.00	0.00	0.00	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
3		100.00	100.00	100.00	100.00	97.37	98.97	100.00	100.00	100.00	90.91	100.00	100.00	98.35											
4		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
5		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
CALM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.		8.	11.	10.	33.	38.	33.	30.	20.	19.	22.	13.	6.	243.											
COMPASS SECTOR																									
a. OCC. N		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
E		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
SE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
S		93.75	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.82											
SW		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
W		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NW		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
CALM		0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.		16.	27.	43.	19.	21.	24.	24.	22.	20.	16.	19.	15.	268.											
BREAKER TYPE																									
ROCK SPILL		0.00	0.00	0.00	3.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
SP/L		25.00	26.32	18.87	83.85	15.39	28.07	22.22	4.76	25.00	33.47	38.71	28.57	39											
PLUNGE		0.83	65.96	81.13	42.31	64.41	70.18	77.79	95.24	75.00	40.53	61.29	71.43	69.55											
SURGE		0.00	7.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
CALM		9.17	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.		24.	38.	53.	52.	59.	57.	54.	42.	40.	38.	31.	21.	509.											
CURRENT OBS.																									
(FT/SEC)																									
NET MEAN		0.67	0.41	0.13	0.20	0.12	0.21	0.08	0.13	0.24	0.33	0.34	0.10	0.22											
GROSS MEAN		.95	.59	.56	.66	.78	.69	.53	.68	.59	.66	.68	.69	.64											
STD DEV		.47	.48	.42	.49	.44	.53	.42	.45	.51	.48	.48	.48	.46											
NO. OBS.		24.	38.	53.	50.	59.	57.	54.	42.	40.	38.	32.	21.	508.											
FORESHORE SLOPE																									
MEAN (HLS)		3.88	5.11	4.23	3.37	2.93	2.61	2.83	2.67	4.20	6.79	4.94	4.81	3.65											
STD DEV		1.70	2.10	2.30	2.49	1.86	1.26	.92	1.03	1.87	2.45	1.68	1.94	2.05											
NO. OBS.		24.	38.	53.	52.	59.	57.	54.	42.	40.	38.	32.	21.	510.											
RIPS 1 DEC		0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
MEAN SPAC.		0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.		24.	38.	53.	52.	59.	57.	54.	42.	40.	38.	32.	21.	510.											
CUSPS 1 DEC.		87.50	89.47	81.13	69.23	88.81	21.08	44.44	71.43	45.00	23.68	90.63	90.48	57.25											
MEAN SPAC.		98.24	102.00	107.63	68.47	59.24	44.17	60.63	74.77	67.61	143.56	97.48	102.32	86.99											
NO. OBS.		24.	38.	53.	52.	59.	57.	54.	42.	40.	38.	32.	21.	510.											

5301 SHELTER CUBE CALIFORNIA SUMMARY FOR PERIOD STARTING 2-20-69 AND ENDING 12-30-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	0.00	2.71	1.74	2.14	2.05	1.66	1.50	1.77	3.90	2.69	2.79	2.93	2.25
STD DEV	0.00	.95	.96	1.30	.80	.93	1.32	1.27	1.79	1.25	1.13	1.79	1.44
NO. OBS.	0.	7.	23.	19.	21.	24.	24.	22.	21.	16.	19.	15.	211.
PERIOD (SEC)													
MEAN	0.00	13.93	16.21	12.14	11.64	9.99	8.53	10.05	12.19	11.43	11.68	11.88	11.61
STD DEV	0.00	2.11	2.90	2.44	2.56	2.43	2.48	2.31	2.96	2.99	3.26	2.44	3.31
NO. OBS.	0.	7.	23.	19.	21.	24.	24.	22.	21.	16.	19.	15.	211.
DIRECTION													
COMPASS SECTOR													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	7.	23.	19.	21.	24.	24.	22.	20.	16.	19.	15.	210.
WAVE TYPE													
WAVE SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	7.	23.	19.	21.	24.	24.	22.	21.	16.	19.	15.	211.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	-0.04	-0.11	-0.25	-0.24	-0.25	-0.14	-0.26	-0.22	-0.39	-0.24	-0.18	-0.14
GROSS MEAN	0.00	.27	.47	.61	.88	.48	.36	.48	.45	.70	.63	.62	.56
STD DEV	0.00	.26	.34	.54	.49	.44	.38	.44	.39	.39	.45	.58	.44
NO. OBS.	0.	7.	23.	17.	21.	24.	24.	22.	21.	16.	19.	15.	209.
FORESHORE SLOPE													
MEAN (DEG)	0.00	4.87	2.89	2.89	2.48	2.04	2.34	2.68	4.00	5.56	4.84	4.40	3.61
STD DEV	0.00	2.54	2.10	2.83	1.08	.75	1.02	.89	1.73	3.22	1.80	1.18	2.15
NO. OBS.	0.	7.	23.	19.	21.	24.	24.	22.	21.	16.	19.	15.	211.
RIPS & UCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	7.	23.	19.	21.	24.	24.	22.	21.	16.	19.	15.	211.
CURPS & OCC.	0.00	100.00	100.00	100.00	38.10	20.83	29.17	86.36	57.14	56.25	100.00	86.67	66.82
MEAN SPAC.	0.00	93.88	95.39	94.16	74.50	67.20	90.43	95.79	91.75	143.56	101.63	111.08	94.38
NO. OBS.	0.	7.	23.	19.	21.	24.	24.	22.	21.	16.	19.	15.	211.



SUMMARY FOR PERIOD STARTING 1-1-70 AND ENDING 12-19-70.

[illegible]

# 5301 SHELTER COVE CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 3-71 AND ENDING 7-13-71.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF HRS.</b>													
MEAN	2.50	3.30	2.60	2.71	2.78	1.92	1.00	0.00	0.00	0.00	0.00	0.00	2.48
STD DEV	1.60	1.86	1.78	.99	1.24	1.04	0.00	0.00	0.00	0.00	0.00	0.00	1.43
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.
<b>PERIOD (SEC)</b>													
MEAN	11.79	11.00	12.42	11.64	11.61	12.91	11.60	0.00	0.00	0.00	0.00	0.00	11.90
STD DEV	2.88	1.76	2.45	.96	3.57	2.88	2.30	0.00	0.00	0.00	0.00	0.00	2.57
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
0 NLC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20
3	100.00	100.00	100.00	100.00	94.74	100.00	100.00	0.00	0.00	0.00	0.00	0.00	98.80
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.
<b>WAVE TYPE</b>													
TOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/PL	75.00	90.91	100.00	100.00	100.00	69.23	37.50	0.00	0.00	0.00	0.00	0.00	85.54
PLUNGE	25.00	9.09	0.00	0.00	0.00	30.77	62.50	0.00	0.00	0.00	0.00	0.00	14.46
SUEGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.
<b>CURRENT OBS.</b>													
MEAN	-1.10	-0.37	-0.20	-0.12	-0.44	-0.33	-0.21	0.00	0.00	0.00	0.00	0.00	-0.37
STD DEV	1.10	.43	.48	.62	.75	.42	.56	0.00	0.00	0.00	0.00	0.00	.71
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.
<b>FORESHORE SLOPE</b>													
MEAN (DEG)	4.25	4.45	3.90	5.07	3.42	3.69	2.88	0.00	0.00	0.00	0.00	0.00	3.96
STD DEV	2.66	2.73	2.47	2.67	1.64	1.45	.99	0.00	0.00	0.00	0.00	0.00	2.20
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.
<b>RIPS &amp; CCC</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.
<b>CUSPS &amp; RCC.</b>													
MEAN SPAC.	100.00	100.00	90.00	71.43	0.00	7.69	75.00	0.00	0.00	0.00	0.00	0.00	54.22
NO. OBS.	8.	11.	10.	14.	19.	13.	8.	0.	0.	0.	0.	0.	83.

20 FEB 1969 10 13 JUL 1971

5026 MACKENWICHEN CALIFORNIA SUMMARY FOR PERIOD STARTING 4-20-00 AND ENDING 12-20-10.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)													
MEAN	3.21	4.25	2.80	3.54	2.53	2.71	2.11	1.94	2.91	3.35	3.57	3.48	2.97
STD DEV	1.86	2.69	1.61	1.59	3.35	.95	.90	1.02	1.46	1.62	2.01	2.28	1.90
NO. OBS.	29.	24.	15.	24.	51.	24.	90.	88.	103.	113.	100.	69.	730.
<b>PERIOD (SEC)</b>													
MEAN	10.78	12.31	11.37	10.31	8.98	8.25	11.50	11.32	9.35	10.29	11.89	12.55	10.83
STD DEV	2.08	1.44	2.44	2.90	2.68	2.71	4.15	3.56	1.97	2.28	2.86	2.59	3.09
NO. OBS.	28.	23.	14.	24.	49.	23.	91.	84.	104.	102.	100.	72.	716.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.00	2.44	.63
2	0.00	0.00	0.00	0.00	0.00	0.00	6.78	0.00	0.00	0.00	0.00	2.44	1.62
3	0.00	0.00	0.00	0.00	0.00	50.00	49.49	98.28	98.15	100.00	100.00	95.12	92.56
4	0.00	0.00	0.00	0.00	0.00	50.00	23.73	1.72	0.00	0.00	0.00	0.00	5.18
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	2.	59.	58.	54.	43.	52.	41.	309.
<b>COMPASS SECTOR</b>													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91.30	91.30	68.67	61.67	61.67	12.22	17.27	14.29	10.34	4.35	7.69	8.89	100.00	84.52
CALM	3.70	0.00	13.33	0.00	16.67	4.55	7.14	20.49	6.52	4.92	2.22	0.00	6.88
NO. OBS.	27.	23.	15.	24.	54.	22.	28.	29.	46.	65.	45.	29.	407.
<b>BREAKER TYPE</b>													
30CC SPILL	63.52	91.67	80.00	95.83	75.93	66.67	85.71	72.94	33.85	59.41	43.56	41.67	63.72
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	7.69	12.94	24.04	17.70	14.65	36.11	14.13
PLUNGE	27.59	4.17	0.00	4.17	13.96	29.17	4.00	9.41	8.65	13.27	27.72	8.33	12.77
BURGE	3.45	4.17	13.33	0.00	3.70	0.00	2.20	0.00	13.46	10.62	13.86	13.69	7.88
CALM	3.45	0.00	6.67	0.00	7.41	4.17	0.00	4.71	0.00	0.00	0.00	0.00	1.49
NO. OBS.	29.	24.	15.	24.	54.	24.	91.	88.	104.	113.	101.	72.	736.
<b>CURRENT OBS.</b>													
(FT/SEC)													
MEAN	-.01	0.00	0.00	0.00	.00	.03	0.00	-.02	.07	-.01	.01	.01	.01
STD DEV	.01	0.00	0.00	0.00	.13	.03	.13	.02	.07	.06	.02	.03	.03
NO. OBS.	26.	20.	10.	19.	34.	12.	44.	.10	.31	.20	.11	.13	.32
<b>FORESHORE SLOPE</b>													
MEAN (COE)	7.77	8.09	6.53	6.20	6.79	7.14	7.02	7.20	9.97	7.01	6.80	7.09	7.02
STD DEV	.82	1.06	1.25	.62	2.07	1.23	1.47	1.55	1.45	1.64	1.53	1.39	1.50
NO. OBS.	26.	22.	15.	20.	33.	14.	40.	44.	64.	83.	71.	58.	501.
<b>RIPS &amp; OCC</b>													
MEAN SPAC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.99	1.39	.27
NO. OBS.	29.	24.	15.	24.	54.	25.	90.	88.	104.	113.	101.	72.	739.
<b>CUSPS &amp; OCC.</b>													
MEAN SPAC	89.66	83.33	93.33	87.50	62.96	56.00	91.65	53.27	68.37	68.19	72.28	80.56	67.70
NO. OBS.	120.02	155.33	153.93	142.52	102.56	113.57	113.85	97.22	99.68	121.57	121.26	138.28	117.15
NO. OBS.	29.	24.	15.	24.	54.	25.	91.	88.	104.	113.	101.	72.	740.

# 5026 WACATERMICHEN CALIFORNIA SUMMARY FOR PERIOD STARTING 4-26-68 AND ENDING 12-31-68.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SUBP. OBS.													
HEIGHT (FT)	0.00	0.00	0.00	2.63	2.56	2.95	2.45	2.10	3.00	3.43	3.33	3.53	2.92
MEAN	0.00	0.00	0.00	.92	3.52	.89	.91	1.35	1.62	1.39	1.24	1.85	1.93
STD DEV	0.00	0.00	0.00	0.	43.	20.	29.	29.	24.	40.	33.	50.	256.
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PEPINO (SEC)													
MEAN	0.00	0.00	0.00	8.66	8.84	8.27	9.12	8.94	9.33	9.40	11.56	11.83	9.68
STD DEV	0.00	0.00	0.00	3.17	2.68	2.75	2.61	2.95	2.65	1.88	2.83	2.10	2.80
NO. OBS.	0.	0.	0.	0.	44.	20.	29.	25.	24.	39.	33.	31.	253.
DIRECTION													
COMPASS SECTOR													
O. OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O. OCC. NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O. OCC. E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O. OCC. SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O. OCC. S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O. OCC. SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O. OCC. W	0.00	0.00	0.00	25.00	13.04	20.00	14.29	10.34	9.09	13.89	12.12	0.00	11.95
O. OCC. NW	0.00	0.00	0.00	75.00	73.91	80.00	78.57	68.97	66.36	83.33	84.85	100.00	81.27
CALM	0.00	0.00	0.00	0.00	13.04	0.00	7.14	20.69	4.55	2.78	3.03	0.00	6.77
NO. OBS.	0.	0.	0.	0.	46.	20.	28.	29.	22.	36.	33.	29.	251.
WHEATER TYPE													
INCC SPILL	0.00	0.00	0.00	87.50	76.26	65.00	82.76	70.37	87.50	82.50	52.94	70.97	74.52
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	12.50	18.22	35.00	13.79	14.81	12.50	15.00	47.06	19.35	20.85
SURGE	0.00	0.00	0.00	0.00	4.35	0.00	3.45	0.00	0.00	2.90	0.00	9.68	2.70
CALM	0.00	0.00	0.00	0.00	2.17	0.00	0.00	14.81	0.00	0.00	0.00	0.00	1.93
NO. OBS.	0.	0.	0.	0.	46.	20.	29.	27.	24.	40.	34.	31.	259.
CURRENT OBS.													
(FT/SEC)													
MEAN	0.00	0.00	0.00	0.00	.00	.04	0.00	-.06	.27	-.03	.04	.03	.03
STD DEV	0.00	0.00	0.00	0.00	.17	.04	0.00	.06	.27	.16	.05	.06	.11
NO. OBS.	0.	0.	0.	5.	26.	9.	13.	13.	.59	.32	.18	.19	.29
FORESHORE SLOPE													
MEAN (DEG)	0.00	0.00	0.00	6.40	7.08	7.45	8.31	7.72	7.61	8.00	7.23	7.89	7.63
STD DEV	0.00	0.00	0.00	1.14	2.27	1.13	.95	1.56	1.11	.94	.95	1.01	1.38
NO. OBS.	0.	0.	0.	5.	25.	11.	16.	18.	16.	26.	26.	27.	170.
RIPS													
% OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	46.	21.	29.	29.	24.	40.	34.	31.	262.
CUSPS													
% OCC.	0.00	0.00	0.00	62.50	56.52	52.38	55.17	55.17	75.00	57.50	73.53	90.32	64.12
MEAN SPAC.	0.00	0.00	0.00	100.20	101.81	117.27	112.25	95.50	109.67	121.17	124.36	148.00	115.52
NO. OBS.	0.	0.	0.	0.	46.	21.	29.	29.	24.	40.	34.	31.	262.

# SUMMARY FOR PERIOD STARTING 1- 1-69 AND ENDING 12-31-69.

## CALIFORNIA

## 5026 MACHENMICHEN

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)	3.37	0.41	2.79	4.00	2.30	.50	0.00	0.00	1.43	3.97	5.41	7.25	4.08
MEAN	1.57	2.75	1.67	1.67	2.45	.71	0.00	0.00	1.47	1.71	2.39	3.24	2.31
STD DEV	27.	22.	14.	16.	8.	2.	0.	0.	24.	30.	22.	8.	173.
NO. OBS.													
<b>PERIOD (SEC)</b>													
MEAN	10.76	12.25	11.09	11.13	10.24	4.70	0.00	0.00	8.78	10.15	11.50	12.75	10.76
STD DEV	2.09	1.97	2.31	2.45	2.53	0.00	0.00	0.00	1.19	1.68	2.91	3.31	2.43
NO. OBS.	27.	22.	13.	16.	5.	1.	0.	0.	24.	30.	22.	8.	168.
<b>DIRECTION</b>													
<b>COASTAL SECTION</b>													
0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	16.
<b>COMPASS SECTION</b>													
0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	25.	21.	14.	16.	8.	2.	0.	0.	24.	29.	12.	0.	151.
<b>BREAKER TYPE</b>													
0 OCC	70.37	90.91	78.57	100.00	62.50	50.00	0.00	0.00	100.00	90.00	81.82	100.00	86.13
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	29.63	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SURGE	0.00	4.55	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	7.14	0.00	37.50	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	27.	22.	14.	16.	8.	2.	0.	0.	24.	30.	22.	8.	173.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
GROSS MEAN	.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.00
STD DEV	.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.01
NO. OBS.	24.	20.	9.	14.	8.	2.	0.	0.	23.	29.	20.	8.	157.
<b>FURROWS SLOPE</b>													
MEAN (NEG)	7.63	8.00	6.64	6.13	5.88	6.00	0.00	0.00	6.58	6.40	6.84	6.50	6.86
STD DEV	.82	1.00	1.22	.35	.83	1.41	0.00	0.00	1.79	2.04	2.24	1.20	1.63
NO. OBS.	24.	21.	14.	15.	8.	2.	0.	0.	24.	30.	19.	8.	165.
<b>RIPS &amp; OCC</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	27.	22.	14.	16.	8.	2.	0.	0.	24.	30.	22.	8.	173.
<b>CUSPS &amp; OCC.</b>													
MEAN SPAC.	123.67	156.82	155.34	155.75	105.00	75.00	0.00	0.00	79.17	121.03	132.67	151.88	127.76
NO. OBS.	27.	22.	14.	16.	8.	2.	0.	0.	24.	30.	22.	8.	173.

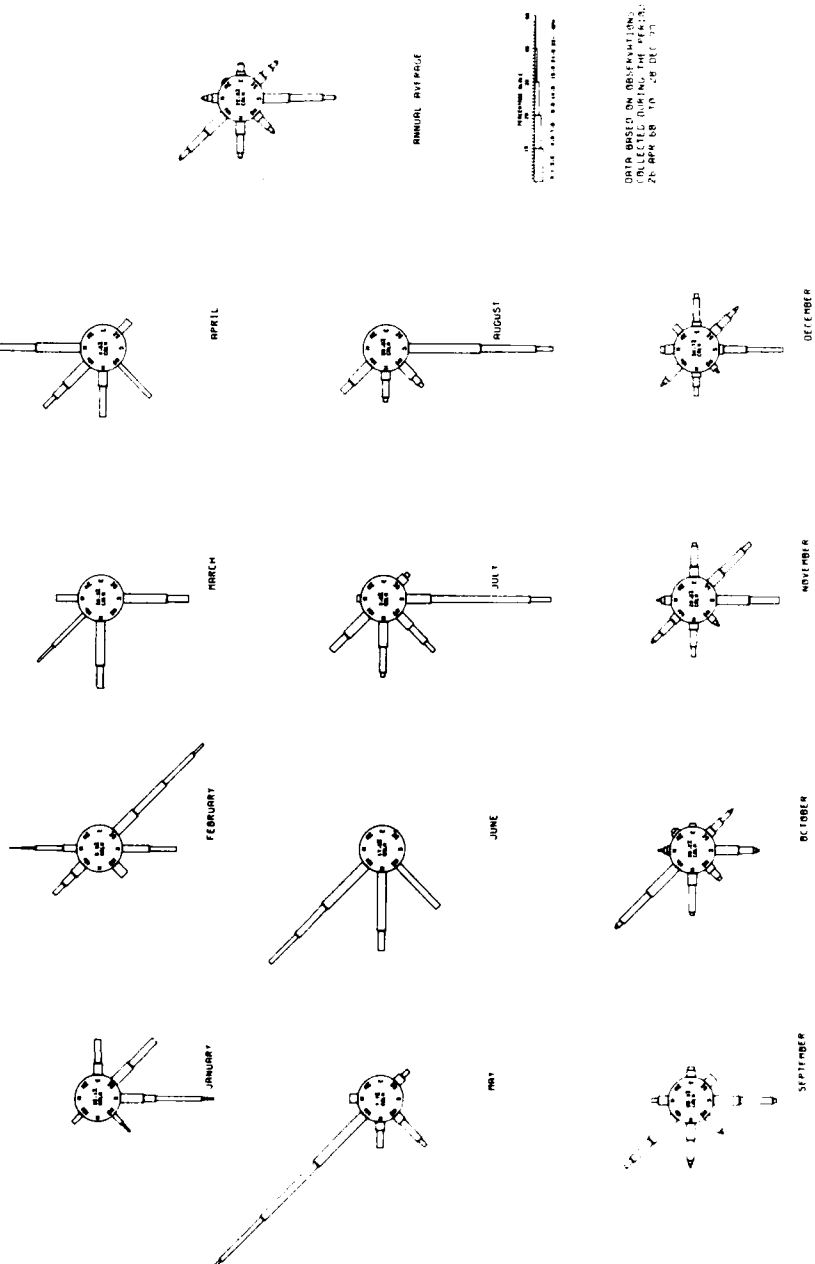
# 5026 MACKENNAICHEN CALIFORNIA

SUMMARY FOR PERIOD STARTING 1- 6-70 AND ENDING 12-28-70.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)	1.00	2.50	3.00	0.00	0.00	2.50	1.95	1.96	2.56	2.96	2.60	2.90	2.38
MEAN	1.41	.71	0.00	0.00	0.00	.71	.86	.82	1.27	2.12	1.23	1.00	1.34
STD DEV	2.	2.	1.	0.	0.	2.	61.	59.	55.	43.	45.	31.	301.
NO. OBS.													
PERIOD (SEC)													
MEAN	11.50	13.50	15.00	0.00	0.00	9.85	12.61	12.33	9.60	11.39	12.33	13.18	11.85
STD DEV	0.00	0.00	0.00	0.00	0.00	.21	4.28	3.33	1.87	2.69	2.85	2.73	3.31
NO. OBS.	1.	1.	1.	0.	0.	2.	62.	59.	56.	35.	45.	33.	295.
DIRECTION													
COASTAL SECTION													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.00	3.03	.68
2	0.00	0.00	0.00	0.00	0.00	0.00	6.78	0.00	0.00	0.00	0.00	3.03	1.71
3	0.00	0.00	0.00	0.00	0.00	50.00	69.49	98.28	98.15	100.00	100.00	93.94	92.15
4	0.00	0.00	0.00	0.00	0.00	50.00	23.73	1.72	0.00	0.00	0.00	0.00	5.46
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	2.	59.	58.	54.	43.	44.	33.	293.
COMPASS SECTION													
OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
NW	50.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
CALM	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00
NO. OBS.	2.	2.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5.
BREAKER TYPE													
BOCC SPILL	0.00	100.00	100.00	0.00	0.00	100.00	87.10	74.14	19.64	15.95	17.78	0.00	41.78
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	11.29	18.97	44.94	46.51	33.33	78.79	34.21
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.90	10.71	16.28	17.78	0.00	8.22
SURGE	50.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	25.00	23.26	31.21	21.21	15.46
CALM	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
NO. OBS.	2.	2.	1.	0.	0.	2.	62.	58.	56.	43.	45.	33.	304.
CURRENT OBS.													
(PF/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	.19	0.00	0.00	0.00	0.00	0.00	.04
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	0.00	.46
NO. OBS.	2.	0.	1.	0.	0.	1.	31.	31.	29.	19.	25.	22.	161.
FURROWS SLOPE													
MEAN (DEG)	7.00	10.00	5.00	0.00	0.00	6.00	6.33	6.85	6.59	6.74	6.35	6.35	6.55
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	1.21	1.46	1.09	1.23	1.26	1.37	1.28
NO. OBS.	2.	1.	1.	0.	0.	1.	30.	26.	29.	27.	26.	23.	166.
RIPS & OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	3.03	.66
NO. OBS.	2.	2.	1.	0.	0.	2.	61.	59.	56.	43.	45.	33.	18.31
CUSPS & OCC.													
MEAN SPAC.	100.00	50.00	100.00	0.00	0.00	50.00	50.00	50.85	51.79	58.14	60.00	66.67	55.61
NO. OBS.	133.50	133.00	135.00	0.00	0.00	150.00	114.68	98.13	111.10	122.56	100.52	120.95	112.91
NO. OBS.	2.	2.	1.	0.	0.	2.	62.	59.	56.	41.	45.	33.	105.

# CALIFORNIA

## WIND ROSES 05026 MACKERRICHER





# 5025 RUSSIAN GULCH CALIFORNIA

## SUMMARY FOR PERIOD STARTING 4-25-68 AND ENDING 8-30-70.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)	1.12	1.43	1.21	1.11	1.80	.91	1.40	1.00	.38	1.15	1.42	1.94	1.35
MEAN	.78	.65	.86	1.27	3.44	2.59	2.16	.45	.52	.92	.94	.73	1.69
STD DEV	17.	37.	29.	38.	44.	23.	35.	11.	8.	46.	46.	35.	373.
NO. OBS.													
<b>PERIOD (SEC)</b>													
MEAN	10.54	10.51	11.13	10.12	10.10	10.22	10.41	12.28	10.48	10.30	11.29	11.81	10.69
STD DEV	1.80	2.56	1.39	2.73	3.33	1.82	1.63	1.48	2.01	2.04	2.39	3.39	2.51
NO. OBS.	15.	26.	23.	36.	45.	23.	35.	11.	8.	45.	47.	35.	349.
<b>DIRECTION</b>													
COASTAL SECTOR													
W OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	88.89	100.00	0.00	0.00	0.00	0.00	93.10
4	0.00	0.00	0.00	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	3.45
5	0.00	0.00	0.00	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	3.45
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	18.	11.	0.	0.	0.	0.	29.
<b>COMPASS SECTOR</b>													
W OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	98.12	97.30	100.00	97.30	95.45	95.34	87.50	0.00	100.00	97.92	100.00	100.00	97.34
NO. OBS.	3.88	3.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00
CALM	17.	37.	28.	37.	44.	21.	16.	0.	8.	48.	48.	34.	338.
<b>BREAKER TYPE</b>													
TOCC SPILL	88.24	91.89	96.55	97.37	97.78	100.00	45.71	0.00	100.00	89.58	83.33	45.71	83.16
SP/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	3.88	6.11	3.45	2.43	2.22	0.00	0.00	0.00	0.00	8.33	16.67	34.29	8.29
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	54.29	100.00	0.00	0.00	0.00	0.00	8.02
CALM	3.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08	0.00	0.00	.53
NO. OBS.	17.	37.	29.	38.	45.	23.	35.	11.	8.	48.	48.	35.	374.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	.01	.02	.01	.00	0.00	0.00	0.00	.03	0.00	.01
GROSS MEAN	0.00	0.00	0.00	.01	.04	.01	.00	0.00	0.00	0.00	.03	0.00	.01
STD DEV	0.00	0.00	0.00	.07	.14	.03	.01	0.00	0.00	0.00	.13	0.00	.07
NO. OBS.	10.	19.	15.	24.	28.	14.	16.	0.	5.	29.	26.	21.	207.
<b>FORESHORE SLOPE</b>													
MEAN (DEG)	2.73	2.76	2.10	2.55	4.11	3.00	7.07	8.09	6.60	5.08	3.04	3.42	4.17
STD DEV	1.42	1.20	1.00	1.26	4.04	4.38	2.80	1.22	1.82	1.26	1.04	1.16	2.73
NO. OBS.	11.	27.	21.	22.	27.	13.	29.	11.	9.	26.	24.	21.	237.
<b>RIPS &amp; OCC</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	17.	37.	30.	36.	48.	23.	35.	11.	8.	48.	48.	35.	375.
<b>CURBS &amp; OCC.</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	17.	37.	30.	38.	45.	23.	35.	11.	8.	48.	48.	35.	375.

5025 RUSSIAN GULCH CALIFORNIA SUMMARY FOR PERIOD STARTING 4-25-68 AND ENDING 12-20-68.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WAVE HGT (F1)	0.00	0.00	0.00	1.18	2.06	.91	1.06	0.00	.38	.96	1.71	1.50	1.34
MEAN	0.00	0.00	0.00	2.32	4.02	2.65	2.91	0.00	.52	.88	1.00	.73	2.43
STD DEV	0.00	0.00	0.00	11.	32.	22.	16.	0.	6.	24.	44.	16.	157.
NO. OBS.	0.	0.	0.	11.	32.	22.	16.	0.	6.	24.	44.	16.	157.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	9.95	9.90	10.10	10.20	0.00	10.40	9.84	10.50	9.72	10.08
STD DEV	0.00	0.00	0.00	3.40	3.78	1.85	1.19	0.00	2.01	1.05	1.07	1.52	2.27
NO. OBS.	0.	0.	0.	11.	33.	22.	16.	0.	8.	25.	24.	16.	155.
DIRECTION													
COMPASS SECTOR													
WAVE OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	3.13	0.00	6.25	0.00	0.00	0.00	0.00	0.00	1.30
W	0.00	0.00	0.00	90.00	93.75	95.00	87.50	0.00	100.00	96.43	100.00	100.00	95.45
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	10.00	3.13	5.00	6.25	0.00	0.00	3.57	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	10.	32.	20.	16.	0.	8.	28.	24.	16.	154.
BREAKER TYPE													
WAVE SPILL	0.00	0.00	0.00	100.00	100.00	100.00	100.00	0.00	100.00	96.43	87.50	87.50	96.20
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	11.	33.	22.	16.	0.	8.	28.	24.	16.	156.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	.06	.03	.01	.00	0.00	0.00	0.00	.07	0.00	.02
GROSS MEAN	0.00	0.00	0.00	.06	.07	.01	.00	0.00	0.00	0.00	.07	0.00	.03
STD DEV	0.00	0.00	0.00	.15	.18	.03	.02	0.00	0.00	0.00	.19	0.00	.11
NO. OBS.	0.	0.	0.	6.	18.	13.	11.	0.	5.	16.	13.	11.	93.
FORESHORE SLOPE													
MEAN (DEC)	0.00	0.00	0.00	3.83	4.58	5.00	5.50	0.00	6.00	5.60	3.42	4.27	4.80
STD DEV	0.00	0.00	0.00	1.94	4.63	4.38	1.00	0.00	1.52	1.12	1.24	1.10	2.89
NO. OBS.	0.	0.	0.	6.	19.	13.	12.	0.	5.	15.	12.	11.	93.
RIPS & OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	11.	33.	22.	16.	0.	8.	28.	24.	16.	158.
CUSPS & OCC.													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	11.	33.	22.	16.	0.	8.	28.	24.	16.	158.

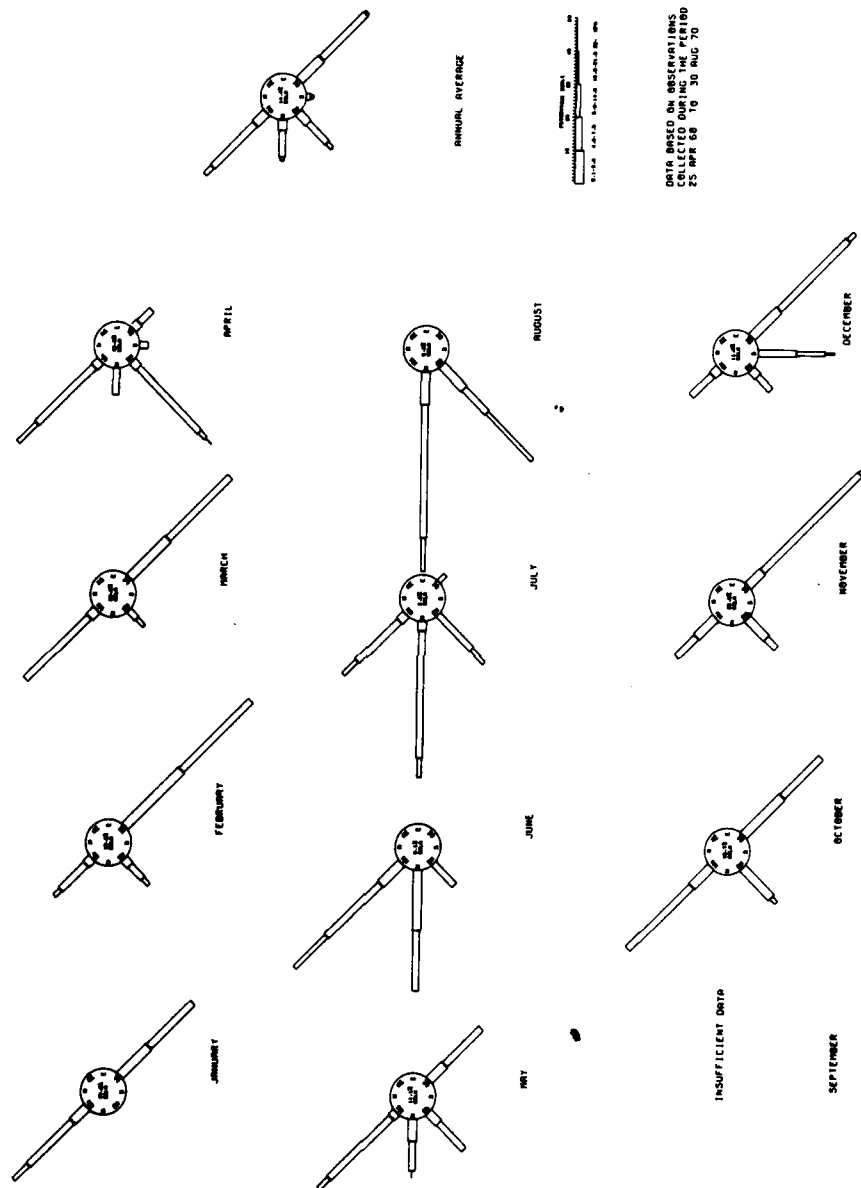
5025 RUSSIAN GULCH CALIFORNIA SUMMARY FOR PERIOD STARTING 1-17-69 AND ENDING 12-7-1969.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	OFC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	1.00	1.28	.90	1.07	1.08	1.00	0.00	0.00	0.00	1.40	1.13	2.32	1.27
STD DEV	.80	.46	.55	.47	.29	0.00	0.00	0.00	0.00	.94	.80	.48	.74
NO. OBS.	12.	18.	20.	27.	12.	1.	0.	0.	0.	20.	24.	19.	153.
PERIOD (SEC)													
MEAN	9.84	9.01	10.77	10.20	10.63	11.20	0.00	0.00	0.00	10.89	12.11	13.57	10.96
STD DEV	1.01	1.14	1.07	2.46	1.50	0.00	0.00	0.00	0.00	2.75	3.06	3.56	2.67
NO. OBS.	12.	18.	20.	25.	12.	1.	0.	0.	0.	20.	23.	19.	150.
DIRECTION													
COMPASS SECTION													
OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	12.	18.	19.	27.	12.	1.	0.	0.	0.	20.	24.	18.	151.
RIFFAKER TYPE													
20CC SPILL	100.00	63.33	95.00	96.30	91.67	100.00	0.00	0.00	0.00	80.00	79.17	47.37	83.66
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	16.67	5.00	3.70	6.33	0.00	0.00	0.00	0.00	20.00	20.83	52.63	16.34
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	12.	18.	20.	27.	12.	1.	0.	0.	0.	20.	24.	19.	153.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	7.	13.	13.	18.	10.	1.	0.	0.	0.	13.	13.	10.	98.
FURFSHORE SLOPE													
MEAN (DEG)	2.17	2.20	2.15	2.06	3.00	0.00	0.00	0.00	0.00	4.36	2.67	2.90	2.66
STD DEV	1.00	1.14	1.14	.25	1.85	0.00	0.00	0.00	0.00	1.12	.65	.74	1.25
NO. OBS.	6.	10.	13.	16.	8.	0.	0.	0.	0.	11.	12.	10.	86.
RIPS % OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	12.	18.	21.	27.	12.	1.	0.	0.	0.	20.	24.	19.	154.
CUSPS % OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	4.17	5.26	7.79
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.50	20.00	15.00	8.28
NO. OBS.	12.	18.	21.	27.	12.	1.	0.	0.	0.	20.	24.	19.	154.

5025 RUSSIAN GULCH				SUMMARY FOR PERIOD STARTING 1-18-70 AND ENDING 6-30-70.												
CALIFORNIA				JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURE OBS.																
HEIGHT (FT)																
MEAN	1.40	1.54	1.89	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.54
STD DEV	1.10	.77	1.05	0.00	0.00	0.00	0.00	0.00	0.00	1.25	.95	0.00	0.00	0.00	0.00	.98
NO. OBS.	5.	19.	9.	0.	0.	0.	0.	0.	0.	19.	11.	0.	0.	0.	0.	63.
PERIOD (SEC)																
MEAN	13.33	13.44	13.57	0.00	0.00	0.00	0.00	0.00	0.00	10.53	12.28	0.00	0.00	0.00	0.00	11.98
STD DEV	1.53	1.07	.40	0.00	0.00	0.00	0.00	0.00	0.00	1.95	1.08	0.00	0.00	0.00	0.00	2.11
NO. OBS.	3.	4.	3.	0.	0.	0.	0.	0.	0.	14.	11.	0.	0.	0.	0.	44.
DIRECTION																
COASTAL SECTOR																
UCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.89	100.00	0.00	0.00	0.00	0.00	93.10
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	3.45
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	3.45
CAL.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	18.	11.	0.	0.	0.	0.	29.
COMPASS SECTOR																
UCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	94.74	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.98
N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAL.	20.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.06
NO. OBS.	5.	19.	9.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	33.
WRECKER TYPE																
UCC. SPILL	0.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.21
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00	47.62
CAL.	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59
NO. OBS.	5.	19.	9.	0.	0.	0.	0.	0.	0.	19.	11.	0.	0.	0.	0.	63.
CURRENT OBS.																
(FT/SEC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	3.	6.	2.	0.	0.	0.	0.	0.	0.	3.	0.	0.	0.	0.	0.	16.
FRESHWATER SLOPE																
MEAN (NKG)	1.40	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.09	0.00	0.00	0.00	0.00	5.40
STD DEV	.89	1.14	.76	0.00	0.00	0.00	0.00	0.00	0.00	2.16	1.22	0.00	0.00	0.00	0.00	3.06
NO. OBS.	5.	17.	8.	0.	0.	0.	0.	0.	0.	17.	11.	0.	0.	0.	0.	58.
WIPS & UCC																
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	5.	19.	9.	0.	0.	0.	0.	0.	0.	19.	11.	0.	0.	0.	0.	63.
CUSPS & UCC.																
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	5.	19.	9.	0.	0.	0.	0.	0.	0.	19.	11.	0.	0.	0.	0.	63.

# CALIFORNIA

## WIND ROSES 05025 RUSSIAN GULCH



5024 VAN DAMME RCM CALIFORNIA SUMMARY FOR PERIOD STARTING 4-26-68 AND ENDING 12-31-68.

SURF (IRS.)	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	.44	.84	.50	.63	1.42	1.03	2.39	2.07	1.62	1.06
STD DEV	0.00	0.00	0.00	.53	2.79	.60	.63	1.38	.61	1.23	1.39	2.10	1.63
NO. OBS.	0.	0.	0.	9.	56.	56.	49.	52.	29.	23.	15.	11.	302.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	9.32	6.57	6.74	6.80	7.37	10.01	11.52	10.94	11.57	7.92
STD DEV	0.00	0.00	0.00	2.16	.98	1.31	1.52	1.49	3.16	2.76	2.02	2.57	2.51
NO. OBS.	0.	0.	0.	10.	53.	57.	50.	51.	28.	23.	15.	7.	294.
DIRECTION													
COMPASS SECTOR													
0.000. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.92	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	87.04	94.55	70.63	82.69	65.52	0.00	0.00	0.00	0.34
W	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	3.45	34.78	46.87	33.33	11.78
NW	0.00	0.00	0.00	11.11	1.85	3.64	0.00	1.92	10.34	56.92	13.33	0.00	7.74
CALM	0.00	0.00	0.00	22.22	9.26	1.82	4.17	11.54	13.79	8.70	20.00	50.00	10.44
NO. OBS.	0.	0.	0.	9.	54.	55.	48.	52.	29.	23.	15.	12.	297.
MEASUREMENT TYPE													
XNCC SPILL	0.00	0.00	0.00	22.22	52.94	69.23	78.43	56.86	93.10	92.38	37.50	21.43	61.56
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	77.78	47.06	30.77	21.57	37.25	3.45	42.86	62.50	42.86	35.03
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	1.02
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.45	4.76	0.00	35.71	2.38
NO. OBS.	0.	0.	0.	9.	51.	52.	51.	51.	29.	21.	10.	14.	294.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	-.02	-.12	-.06	-.02	-.06	-.06	-.01	0.00	-.04	-.05
GROSS MEAN	0.00	0.00	0.00	.03	.16	.09	.08	.07	.06	.03	0.00	.04	.08
STD DEV	0.00	0.00	0.00	.05	.22	.10	.07	.08	.06	.08	0.00	.10	.11
NO. OBS.	0.	0.	0.	5.	29.	28.	29.	28.	25.	17.	16.	4.	181.
FURROWS SLOPE													
MEAN (NEG)	0.00	0.00	0.00	4.60	6.04	6.01	6.54	6.86	6.86	5.50	4.54	4.21	6.07
STD DEV	0.00	0.00	0.00	1.67	2.31	1.29	1.23	.88	.73	1.46	1.15	.89	1.61
NO. OBS.	0.	0.	0.	5.	27.	28.	28.	29.	21.	16.	16.	14.	184.
RIPS & OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	.32
NO. OBS.	0.	0.	0.	10.	54.	57.	51.	53.	30.	24.	17.	14.	314.
CUSPS & OCC.													
MEAN SPAC.	0.00	0.00	0.00	50.00	50.00	49.12	52.94	49.06	76.67	29.17	35.29	14.29	46.73
NO. OBS.	0.	0.	0.	10.	56.	57.	51.	53.	30.	24.	17.	14.	314.

# CALIFORNIA

## WIND ROSES 05024 VAN DAMME

INSUFFICIENT DATA

NO DATA

NO DATA

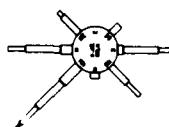
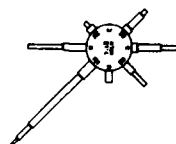
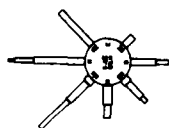
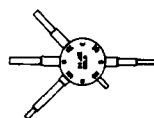
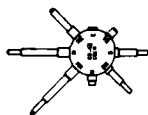
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APRIL

MARCH

FEBRUARY

JANUARY



ANNUAL AVERAGE

AUGUST

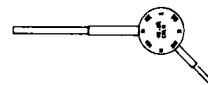
JULY

JUNE

MAY



DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
26 APR 68 TO 31 DEC 68

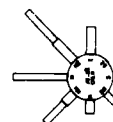
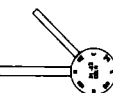


DECEMBER

NOVEMBER

OCTOBER

SEPTEMBER



# SUMMARY FOR PERIOD STARTING 2-24-69 AND ENDING 6-30-70.

## CALIFORNIA

## 5300 NAVARRO

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
<b>HEIGHT (FT)</b>													
<b>MEAN</b>	0.00	5.50	3.00	5.67	3.56	3.43	4.20	4.00	4.75	5.00	2.50	0.00	4.03
<b>STD DEV</b>	0.00	.71	0.00	.50	1.67	1.00	.45	.42	2.06	2.83	.71	0.00	1.40
<b>NO. OBS.</b>	0.	2.	2.	3.	9.	7.	5.	4.	4.	2.	2.	0.	40.
<b>PERIOD (SEC)</b>													
<b>MEAN</b>	0.00	13.75	0.00	14.25	15.60	11.00	15.90	15.00	15.13	19.50	15.00	0.00	14.00
<b>STD DEV</b>	0.00	4.60	0.00	2.47	4.44	1.46	3.13	2.45	2.46	6.16	4.24	0.00	3.52
<b>NO. OBS.</b>	0.	2.	0.	2.	8.	7.	5.	4.	4.	2.	2.	0.	30.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
<b>DEC. 1</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>2</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>3</b>	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>4</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
<b>5</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CALM</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NO. OBS.</b>	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	0.
<b>COMPASS SECTOR</b>													
<b>DEC. N</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NE</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>E</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SE</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>S</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SW</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>W</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NW</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CALM</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NO. OBS.</b>	0.	2.	2.	3.	5.	3.	5.	4.	4.	2.	2.	0.	32.
<b>BREAKER TYPE</b>													
<b>SOCC SPILL</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SP/PL</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>PLUNGE</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>BURGE</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CALM</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NO. OBS.</b>	0.	2.	2.	3.	9.	7.	5.	4.	4.	2.	2.	0.	40.
<b>CURRENT OBS.</b>													
<b>(FT/SEC)</b>													
<b>NET MEAN</b>	0.00	.13	.17	.47	.17	.00	.24	.52	.71	.81	0.00	0.00	.00
<b>GROSS MEAN</b>	0.00	.13	.17	.47	.42	.30	.40	.32	1.05	.31	.09	0.00	.45
<b>STD DEV</b>	0.00	.18	.20	.33	.42	.41	.39	.21	.08	.30	.17	0.00	.36
<b>NO. OBS.</b>	0.	2.	2.	3.	9.	7.	5.	4.	4.	2.	2.	0.	40.
<b>FORESHORE SLOPE</b>													
<b>MEAN (OBS)</b>	0.00	12.00	9.00	9.00	5.67	5.00	0.00	9.00	9.35	5.50	4.50	0.00	7.46
<b>STD DEV</b>	0.00	5.60	0.00	0.54	1.22	2.91	1.44	1.41	1.71	2.12	.71	0.00	3.52
<b>NO. OBS.</b>	0.	2.	1.	3.	9.	7.	5.	4.	4.	2.	2.	0.	39.
<b>RIPS &amp; DEC</b>													
<b>MEAN SPAC</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NO. OBS.</b>	0.	2.	2.	3.	9.	7.	5.	4.	4.	2.	2.	0.	40.
<b>CUSPS &amp; DEC.</b>													
<b>MEAN SPAC</b>	0.00	0.00	0.00	0.00	11.11	26.57	20.00	75.00	75.00	50.00	50.00	0.00	37.50
<b>NO. OBS.</b>	0.	2.	2.	3.	9.	7.	5.	4.	4.	2.	2.	0.	70.00



S300 NAVARRO CALIFORNIA SUMMARY FOR PERIOD STARTING 2-24-69 AND ENDING 11-12-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WEIGHT (FT)													
MEAN	0.00	5.50	3.00	5.67	4.60	4.33	4.20	4.00	4.75	5.00	2.50	0.00	4.41
STD DEV	0.00	.71	0.00	.58	1.52	1.53	.45	.82	2.06	2.83	.71	0.00	1.39
NO. OBS.	0.	2.	2.	3.	5.	3.	5.	4.	4.	2.	2.	0.	32.
PERIOD (SEC)													
MEAN	0.00	13.75	0.00	14.25	16.20	11.00	15.00	15.00	15.13	19.50	15.00	0.00	15.10
STD DEV	0.00	4.60	0.00	2.47	5.83	1.73	3.13	2.45	2.46	6.36	4.24	0.00	3.71
NO. OBS.	0.	2.	0.	2.	4.	3.	5.	4.	4.	2.	2.	0.	20.
DIRECTION													
COMPASS SECTOR													
OCC. "	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	2.	2.	3.	5.	3.	5.	4.	4.	2.	2.	0.	32.
BREAKER TYPE													
XUCC SPILL	0.00	0.00	100.00	66.67	100.00	100.00	100.00	100.00	100.00	50.00	100.00	0.00	87.50
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	100.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.38
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	3.13
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	2.	2.	3.	5.	3.	5.	4.	4.	2.	2.	0.	32.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	-.13	-.17	.47	.26	.15	.24	.52	-.71	-.21	0.00	0.00	.06
GROSS MEAN	0.00	.13	.17	.47	.31	.37	.40	.52	1.04	.21	.09	0.00	.44
STD DEV	0.00	.16	.24	.53	.37	.57	.59	.21	.48	.30	.17	0.00	.36
NO. OBS.	0.	2.	2.	3.	5.	3.	5.	4.	4.	2.	2.	0.	32.
FURFSHORE SLOPE													
MEAN (NEG)	0.00	12.00	9.00	9.00	5.00	8.00	8.80	9.00	9.75	5.50	4.50	0.00	8.00
STD DEV	0.00	5.66	0.00	9.54	.71	3.61	1.64	1.41	1.71	2.12	.71	0.00	3.70
NO. OBS.	0.	2.	1.	3.	5.	3.	5.	4.	4.	2.	2.	0.	31.
RIPS & OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	2.	2.	3.	5.	3.	5.	4.	4.	2.	2.	0.	32.
CUSPS & OCC	0.00	0.00	0.00	0.00	20.00	66.67	80.00	75.00	75.00	50.00	50.00	0.00	48.88
MEAN SPAC.	0.00	0.00	0.00	0.00	43.00	90.00	79.75	60.00	71.67	200.00	50.00	0.00	65.95
NO. OBS.	0.	2.	2.	3.	5.	3.	5.	4.	4.	2.	2.	0.	32.

# SUMMARY FOR PERIOD STARTING 5- 7-70 AND ENDING 6-30-70.

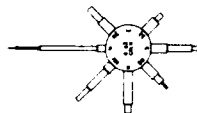
## CALIFORNIA

5300 NAVAMUN

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	2.25	2.75	0.00	0.00	0.00	0.00	0.00	0.00	2.50
STD DEV	0.00	0.00	0.00	0.00	.50	.96	0.00	0.00	0.00	0.00	0.00	0.00	.76
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	8.
<b>PERIOD (SEC)</b>													
MEAN	0.00	0.00	0.00	0.00	15.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	13.75
STD DEV	0.00	0.00	0.00	0.00	3.46	1.00	0.00	0.00	0.00	0.00	0.00	0.00	2.71
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	8.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	8.
<b>BREAKER TYPE</b>													
XOCC SPILL	0.00	0.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	8.
<b>CURRENT OBS.</b>													
(FY/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	.06	.05	0.00	0.00	0.00	0.00	0.00	0.00	.05
<b>GROSS MEAN</b>													
STD DEV	0.00	0.00	0.00	0.00	.56	.45	0.00	0.00	0.00	0.00	0.00	0.00	.50
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	.36
<b>FORESHORT SLOPE</b>													
MEAN (OBS)	0.00	0.00	0.00	0.00	0.50	0.25	0.00	0.00	0.00	0.00	0.00	0.00	5.38
STD DEV	0.00	0.00	0.00	0.00	1.29	.50	0.00	0.00	0.00	0.00	0.00	0.00	1.51
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	8.
<b>RIPS &amp; OCC</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	8.
<b>CUSPS &amp; OCC.</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	4.	4.	0.	0.	0.	0.	0.	0.	8.

# CALIFORNIA

## WIND ROSES 5300 NAVARRO



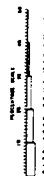
INSUFFICIENT DATA

APRIL

INSUFFICIENT DATA

ANNUAL AVERAGE

AUGUST  
NO DATA



DECEMBER

DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
24 FEB 69 TO 30 JUN 70

INSUFFICIENT DATA

FEBRUARY

INSUFFICIENT DATA

MARCH

INSUFFICIENT DATA

JUNE  
INSUFFICIENT DATA

JULY  
INSUFFICIENT DATA

OCTOBER

NOVEMBER

NO DATA

JANUARY

INSUFFICIENT DATA

MAY  
INSUFFICIENT DATA

SEPTEMBER



5023 MANCHESTER HCM CALIFORNIA SUMMARY FOR PERIOD STARTING 4-26-68 AND ENDING 12-31-68.

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
WIGHT (FT)													
MEAN	0.00	0.00	0.00	3.40	3.46	3.21	3.53	3.49	3.64	3.81	4.42	4.07	3.63
STD DEV	0.00	0.00	0.00	.84	1.35	.77	1.81	1.07	1.34	1.28	.86	1.73	1.35
NO. OBS.	0.	0.	0.	10.	37.	43.	58.	59.	50.	31.	26.	27.	341.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	11.91	12.15	13.30	13.93	13.00	13.04	13.17	14.09	13.46	13.22
STD DEV	0.00	0.00	0.00	1.34	2.16	3.28	3.67	3.43	3.52	3.17	1.52	1.89	3.11
NO. OBS.	0.	0.	0.	10.	37.	44.	60.	59.	52.	30.	26.	27.	345.
DIRECTION													
COMPASS SECTOR													
0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	10.	37.	43.	57.	59.	47.	29.	26.	26.	334.
HMFAKER TYPE													
XOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	10.	36.	44.	58.	59.	47.	28.	24.	27.	333.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	-1.01	-1.18	-1.17	-1.25	-1.12	-0.84	.51	.25	-0.33	-0.69
GROSS MEAN	0.00	0.00	0.00	1.01	1.47	1.31	1.20	1.11	1.45	.82	1.30	1.72	1.26
STD DEV	0.00	0.00	0.00	.49	.76	.83	.72	.71	.66	.57	.75	.58	.68
NO. OBS.	0.	0.	0.	9.	19.	22.	34.	35.	23.	16.	13.	14.	181.
FORTHSHORE SLOPE													
MEAN (DEC)	0.00	0.00	0.00	3.00	18.50	15.76	15.30	16.00	15.83	15.06	14.93	13.71	15.61
STD DEV	0.00	0.00	0.00	0.00	.85	3.62	2.74	0.00	.39	3.75	4.01	2.05	2.84
NO. OBS.	0.	0.	0.	1.	19.	21.	30.	30.	23.	16.	14.	14.	163.
RIPS X OCC	0.00	0.00	0.00	44.44	40.63	39.02	30.51	3.77	26.83	5.88	13.33	13.33	24.47
MEAN SPAC.	0.00	0.00	0.00	775.00	630.77	743.75	611.11	750.00	845.45	800.00	800.00	750.00	768.70
NO. OBS.	0.	0.	0.	9.	32.	41.	59.	53.	41.	17.	15.	15.	282.
CUSPS X OCC	0.00	0.00	0.00	50.00	54.55	54.55	51.67	52.54	50.00	48.39	50.00	51.85	51.30
MEAN SPAC.	0.00	0.00	0.00	200.00	173.64	114.58	100.00	106.45	103.85	103.33	100.00	142.86	118.11
NO. OBS.	0.	0.	0.	10.	38.	44.	60.	59.	52.	31.	26.	27.	347.

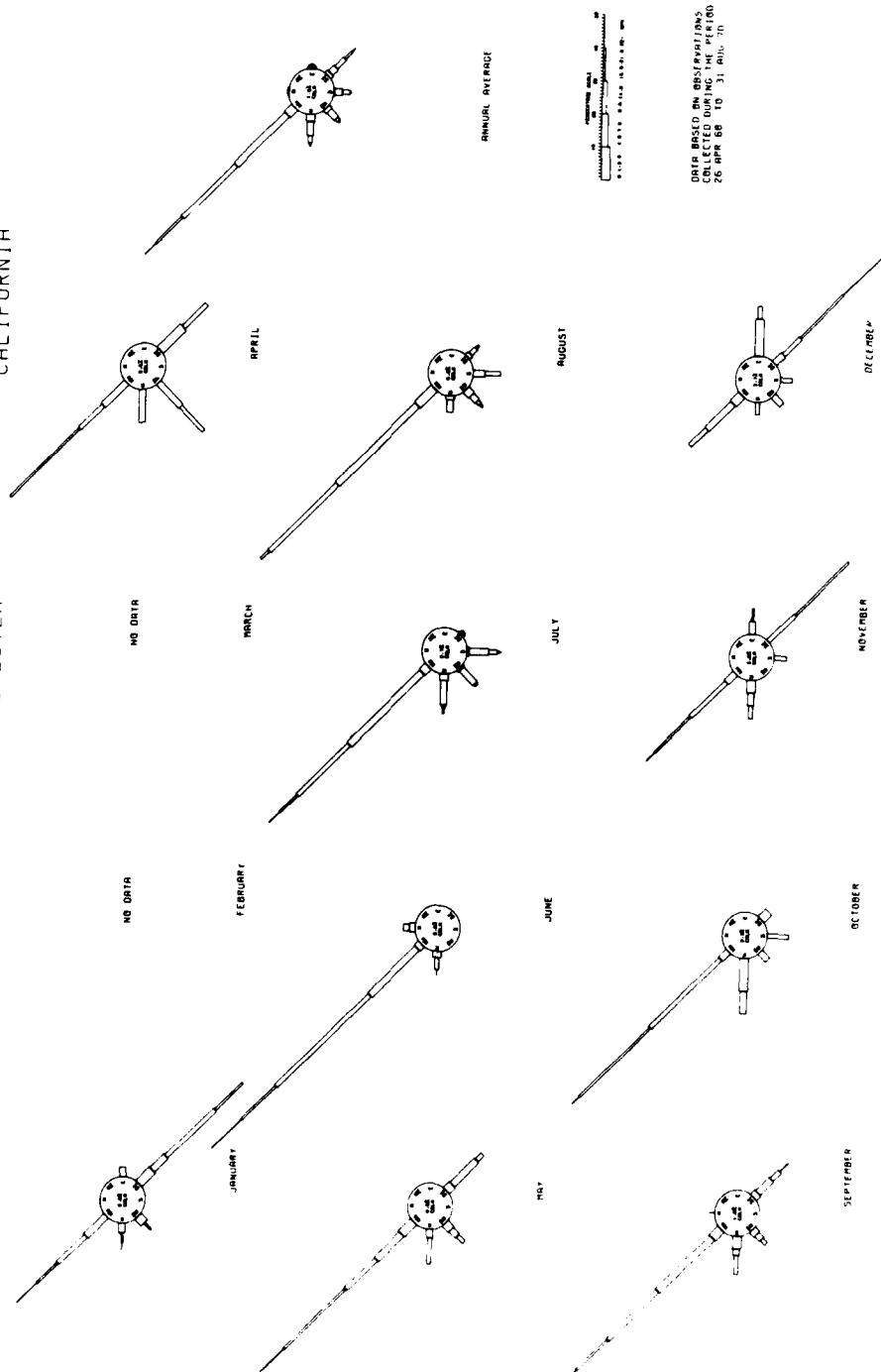
5023 MANCHISTER HCM CALIFORNIA SUMMARY FOR PERIOD STARTING 1-2-69 AND ENDING 7-31-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MOS.
SURF DIRS.													
WEIGHT (FT)													
MEAN	3.05	0.00	0.00	0.00	0.00	3.09	3.38	0.00	0.00	0.00	0.00	0.00	3.22
STD DEV	1.01	0.00	0.00	0.00	0.00	1.04	.92	0.00	0.00	0.00	0.00	0.00	.97
NO. OBS.	38.	0.	0.	0.	0.	11.	50.	0.	0.	0.	0.	0.	99.
PERIOD (SEC)													
MEAN	11.46	0.00	0.00	0.00	0.00	10.62	8.26	0.00	0.00	0.00	0.00	0.00	9.67
STD DEV	2.35	0.00	0.00	0.00	0.00	1.59	1.89	0.00	0.00	0.00	0.00	0.00	2.53
NO. OBS.	35.	0.	0.	0.	0.	11.	52.	0.	0.	0.	0.	0.	98.
DIRECTION													
COMPASS SECTOR													
UCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	100.00	0.00	0.00	0.00	0.00	27.27	30.19	0.00	0.00	0.00	0.00	0.00	53.13
NW	0.00	0.00	0.00	0.00	0.00	72.73	69.81	0.00	0.00	0.00	0.00	0.00	46.86
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	32.	0.	0.	0.	0.	11.	53.	0.	0.	0.	0.	0.	96.
WREAKER TYPE													
BOCC SPILL	0.00	0.00	0.00	0.00	0.00	81.82	68.52	0.00	0.00	0.00	0.00	0.00	76.70
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	13.16	0.00	0.00	0.00	0.00	9.09	24.07	0.00	0.00	0.00	0.00	0.00	18.45
SUNGE	0.00	0.00	0.00	0.00	0.00	9.09	7.41	0.00	0.00	0.00	0.00	0.00	4.85
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	38.	0.	0.	0.	0.	11.	54.	0.	0.	0.	0.	0.	103.
CURRENT DIRS.													
(FT/SEC)													
NET MEAN	.63	0.00	0.00	0.00	0.00	-1.05	-2.17	0.00	0.00	0.00	0.00	0.00	-.97
GROSS MEAN	1.18	0.00	0.00	0.00	0.00	1.03	2.18	0.00	0.00	0.00	0.00	0.00	1.70
STD DEV	.64	0.00	0.00	0.00	0.00	.61	1.02	0.00	0.00	0.00	0.00	0.00	.94
NO. OBS.	19.	0.	0.	0.	0.	5.	28.	0.	0.	0.	0.	0.	52.
FRESHWATER SLOPE													
MEAN (DEG)	12.00	0.00	0.00	0.00	0.00	3.67	5.60	0.00	0.00	0.00	0.00	0.00	7.82
STD DEV	0.00	0.00	0.00	0.00	0.00	3.44	2.01	0.00	0.00	0.00	0.00	0.00	3.56
NO. OBS.	19.	0.	0.	0.	0.	6.	30.	0.	0.	0.	0.	0.	55.
RIPS													
% OCC	17.39	0.00	0.00	0.00	0.00	54.55	51.85	0.00	0.00	0.00	0.00	0.00	43.18
MEAN SPAC.	175.00	0.00	0.00	0.00	0.00	416.67	533.68	0.00	0.00	0.00	0.00	0.00	608.26
NO. OBS.	21.	0.	0.	0.	0.	11.	54.	0.	0.	0.	0.	0.	86.
CUSPS % OCC.	50.00	0.00	0.00	0.00	0.00	45.45	51.85	0.00	0.00	0.00	0.00	0.00	50.49
MEAN SPAC.	100.00	0.00	0.00	0.00	0.00	130.40	111.89	0.00	0.00	0.00	0.00	0.00	109.48
NO. OBS.	18.	0.	0.	0.	0.	11.	54.	0.	0.	0.	0.	0.	103.

5023 MANCHESTER HCM				CALIFORNIA												SUMMARY FOR PERIOD STARTING 7- 6-70 AND ENDING 8-31-70.			
				JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.			
SURF. (MS.)																			
HEIGHT (FT)																			
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.08	3.44	0.00	0.00	0.00	0.00	0.00	0.00	4.83	
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	.71	0.00	0.00	0.00	0.00	0.00	0.00	1.02	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	40.	25.	0.	0.	0.	0.	0.	0.	65.	
PERIOD (SEC)																			
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.34	12.37	0.00	0.00	0.00	0.00	0.00	0.00	10.51	
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.46	3.40	0.00	0.00	0.00	0.00	0.00	0.00	3.72	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	40.	25.	0.	0.	0.	0.	0.	0.	65.	
DIRECTION																			
COASTAL SECTOR																			
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56	
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.77	76.00	0.00	0.00	0.00	0.00	0.00	0.00	70.31	
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00	28.13	
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	39.	25.	0.	0.	0.	0.	0.	0.	64.	
BREAKER TYPE																			
ROCK SPILL																			
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	7.94	
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.00	91.30	0.00	0.00	0.00	0.00	0.00	0.00	80.95	
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	4.35	0.00	0.00	0.00	0.00	0.00	0.00	9.52	
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	40.	23.	0.	0.	0.	0.	0.	0.	63.	
CURRENT OBS.																			
(FT/SEC)																			
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.60	-0.91	0.00	0.00	0.00	0.00	0.00	0.00	-0.75	
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.16	0.00	0.00	0.00	0.00	0.00	0.00	1.03	
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.95	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	20.	16.	0.	0.	0.	0.	0.	0.	36.	
FORESHORE SLOPE																			
MEAN (OBS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	7.60	0.00	0.00	0.00	0.00	0.00	0.00	7.25	
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.14	2.13	0.00	0.00	0.00	0.00	0.00	0.00	2.13	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	17.	15.	0.	0.	0.	0.	0.	0.	32.	
RIPS & OCC																			
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.08	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	40.	25.	0.	0.	0.	0.	0.	0.	51.92	
CUSPS & OCC.																			
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.00	48.00	0.00	0.00	0.00	0.00	0.00	0.00	46.15	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	210.69	135.58	0.00	0.00	0.00	0.00	0.00	0.00	186.46	
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	40.	25.	0.	0.	0.	0.	0.	0.	65.	

# CALIFORNIA

## WIND ROSES 05023 MANCHESTER





SUMMARY FOR PERIOD STARTING 5-1-60 AND ENDING 1-31-73.

CALIFORNIA

5020 GUAY NULA

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)													
MEAN	5.50	5.70	5.19	4.02	4.02	3.55	3.39	3.55	3.95	4.97	5.41	6.22	4.63
STD DEV	2.02	2.04	1.80	1.85	1.17	1.06	1.10	1.33	1.77	1.81	2.21	2.86	1.98
NO. OBS.	200.	159.	171.	172.	231.	234.	242.	224.	225.	228.	224.	222.	2532.
<b>PERIOD (SEC)</b>													
MEAN	11.48	12.47	12.68	11.36	10.68	11.46	10.10	10.25	10.62	11.05	11.84	12.35	11.29
STD DEV	1.81	1.93	2.73	1.98	1.59	2.46	3.40	2.50	1.75	1.86	1.77	2.33	2.40
NO. OBS.	198.	160.	176.	174.	229.	234.	242.	230.	227.	229.	223.	225.	2547.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.00	.96	.96	0.00	0.00	.26
2	7.69	10.42	3.39	4.76	1.72	1.00	6.96	4.59	3.85	10.38	12.24	10.28	6.34
3	83.33	83.33	76.27	72.62	73.28	82.08	84.35	77.98	78.85	80.19	78.57	82.24	79.47
4	8.97	6.25	20.34	22.62	25.00	15.32	6.96	17.43	16.35	8.49	9.18	7.48	13.63
5	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.00	0.00	0.00	0.00	0.00	.04
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	78.	48.	59.	84.	116.	111.	115.	109.	104.	106.	98.	107.	1135.
<b>COMPASS SECTOR</b>													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	24.79	19.39	5.41	3.57	2.70	3.57	1.71	.93	3.58	.89	6.96	.90	.08
W	73.30	73.47	90.09	90.48	82.88	82.14	88.89	90.45	92.92	95.94	91.30	18.41	7.34
NW	1.71	7.14	4.50	4.76	14.41	14.29	6.55	7.48	3.84	3.57	1.74	9.01	6.73
CALM	0.00	0.00	0.00	1.19	0.00	0.00	.85	.93	0.00	0.00	0.00	0.00	.23
NO. OBS.	117.	98.	111.	84.	110.	112.	117.	107.	113.	112.	115.	111.	1308.
<b>BREAKER TYPE</b>													
ROCC S ILL	38.27	34.18	37.50	45.03	53.68	50.21	52.28	45.18	45.33	35.40	41.89	28.57	42.73
SP/L	15.82	12.03	16.07	21.64	21.65	11.50	9.84	15.79	16.44	20.80	22.07	17.86	18.96
PLUNGE	39.80	42.41	40.48	29.24	22.94	34.48	34.02	35.53	36.00	41.59	27.48	35.27	34.84
BUNGE	6.12	11.54	5.95	4.09	1.73	0.00	3.73	3.51	2.22	2.21	8.56	18.30	5.47
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	196.	158.	168.	171.	231.	233.	241.	228.	225.	226.	222.	224.	2523.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	.00	-.05	-.18	-.36	-.14	.00	-.03	.31	.08	.18	-.09	.07	-.00
GROSS MEAN	.91	.97	.80	.76	.71	.68	.68	.79	.82	.87	.78	.99	.81
STD DEV	.72	.91	.89	.64	.62	.70	.71	.77	.74	.70	.64	.90	.72
NO. OBS.	137.	105.	115.	114.	143.	183.	188.	144.	158.	136.	139.	141.	1834.
<b>FORESHORE SLOPE</b>													
MEAN (DLS)	6.86	6.30	5.59	5.44	5.44	5.83	5.52	5.52	6.17	5.99	6.09	6.26	5.94
STD DEV	2.08	2.28	1.92	1.98	1.95	2.21	1.90	2.01	1.96	2.01	2.43	2.66	2.23
NO. OBS.	154.	105.	109.	109.	140.	149.	153.	140.	142.	139.	131.	131.	1592.
<b>RIPS &amp; OCC</b>													
MEAN SPC.	116.87	229.06	137.88	141.40	136.39	9.36	14.34	13.85	14.91	20.96	16.30	9.73	13.10
NO. OBS.	203.	160.	176.	174.	232.	255.	244.	231.	226.	249.	148.30	207.55	153.86
<b>CUSPS &amp; OCC</b>													
MEAN SPC.	50.99	37.04	46.59	46.55	49.87	47.23	39.75	44.16	48.68	53.71	53.74	49.18	47.38
NO. OBS.	172.79	173.77	154.09	151.49	145.18	145.59	150.42	132.31	136.31	160.62	169.18	207.15	157.67
NO. OBS.	202.	162.	176.	174.	232.	235.	244.	231.	228.	229.	227.	220.	2560.

# SUMMARY FOR PERIOD STARTING 5-1-68 AND ENDING 12-31-68.

## CALIFORNIA

### 5020 GOAT RUCK

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	3.81	3.64	3.56	3.96	4.39	5.76	5.69	5.25	4.51
STD DEV	0.00	0.00	0.00	0.00	1.09	1.27	1.27	2.02	2.49	1.43	2.11	2.46	2.02
NO. OBS.	0.	0.	0.	0.	53.	59.	63.	49.	59.	59.	59.	51.	452.
<b>PERIOD (SEC)</b>													
MEAN	0.00	0.00	0.00	0.00	9.66	6.62	9.29	10.12	9.77	11.46	12.06	11.46	10.35
STD DEV	0.00	0.00	0.00	0.00	1.95	1.59	1.58	2.06	1.86	1.48	1.72	1.71	2.03
NO. OBS.	0.	0.	0.	0.	52.	56.	63.	51.	59.	59.	58.	53.	453.
<b>DIRECTION</b>													
<b>COMPASS SECTOR</b>													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	30.77	25.85	17.24	15.22	7.41	7.69	3.64	20.00	15.88
NO. OBS.	0.	0.	0.	0.	52.	55.	58.	46.	54.	52.	55.	50.	422.
<b>WAVE TYPE</b>													
WAVE TYPE													
SPILL	0.00	0.00	0.00	0.00	71.70	86.14	82.26	73.08	72.88	43.86	57.89	57.69	48.74
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	88.30	11.86	17.74	26.92	27.12	56.14	40.35	30.77	29.71
SURF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	11.54	1.55
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	53.	59.	62.	52.	59.	57.	57.	52.	451.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	0.11	0.00	0.15	0.43	0.05	0.23	0.31	0.31	0.04
GROSS MEAN	0.00	0.00	0.00	0.00	0.30	0.39	0.55	0.62	0.80	0.89	0.73	0.92	0.65
STD DEV	0.00	0.00	0.00	0.00	0.27	0.35	0.37	0.72	0.78	0.86	0.66	0.93	0.68
NO. OBS.	0.	0.	0.	0.	27.	35.	37.	30.	33.	31.	32.	28.	253.
<b>FORSHORE SLUFF</b>													
MEAN (SEC)													
STD DEV	0.00	0.00	0.00	0.00	4.31	5.19	5.68	6.15	6.52	5.21	5.97	6.88	5.74
NO. OBS.	0.	0.	0.	0.	26.	31.	34.	27.	35.	25.	40.	26.	3.22
<b>TIPS</b>													
MEAN (SEC)	0.00	0.00	0.00	0.00	5.66	5.08	6.35	11.54	15.25	27.12	8.47	24.07	12.88
STD DEV	0.00	0.00	0.00	0.00	233.33	400.00	250.00	350.00	188.89	58.75	220.00	211.23	237.80
NO. OBS.	0.	0.	0.	0.	53.	59.	63.	52.	59.	59.	59.	54.	458.
<b>CUSPS &amp; OCC.</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	49.06	49.15	46.03	40.38	50.85	52.54	32.20	37.04	44.76
STD DEV	0.00	0.00	0.00	0.00	166.27	195.48	160.03	146.76	136.60	167.48	194.32	155.65	168.23
NO. OBS.	0.	0.	0.	0.	53.	59.	63.	52.	59.	59.	59.	54.	458.

# 5020 GOAT HUCK

## CALIFORNIA

SUMMARY FOR PERIOD STARTING 1-1-69 AND ENDING 12-31-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL YRS.
SURF OBS.													
WEIGHT (FT)													
MEAN	5.53	6.45	5.37	5.37	4.70	3.29	3.71	3.51	4.12	5.18	4.86	7.90	4.99
STD DEV	1.56	1.83	1.28	1.41	1.43	.79	1.29	.49	1.51	1.61	2.28	2.68	2.04
NO. OBS.	59.	89.	57.	57.	60.	59.	62.	61.	59.	61.	59.	61.	789.
PERIOD (SEC)													
MEAN	10.68	12.71	12.51	11.50	11.15	10.56	9.23	9.14	11.23	12.08	12.14	18.02	11.39
STD DEV	1.15	1.47	1.49	2.45	1.66	2.21	2.21	1.68	1.60	1.69	1.65	1.77	2.28
NO. OBS.	57.	51.	58.	58.	60.	59.	62.	67.	60.	61.	54.	62.	709.
DIRECTION													
COMPASS SECTOR													
W. OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. SW	23.64	18.18	1.87	5.36	5.08	5.26	3.39	0.00	3.39	0.00	0.00	1.84	.15
W. OCC. W	72.73	55.91	46.36	42.66	42.92	91.23	96.61	98.36	96.61	100.00	95.00	11.88	6.56
W. OCC. NW	3.64	15.91	1.82	1.79	0.00	3.51	0.00	1.64	0.00	0.00	0.00	0.00	91.25
W. OCC. CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04
W. OCC. NO. OBS.	55.	44.	55.	56.	59.	57.	59.	61.	59.	60.	60.	61.	686.
BREAKER TYPE													
W. OCC. SPILL	47.17	18.00	17.31	54.39	60.60	47.46	53.23	43.55	59.93	57.38	68.33	25.81	46.34
W. OCC. SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. PLUNGE	40.94	62.00	78.85	35.09	35.00	52.54	46.77	56.45	44.07	39.34	25.00	40.32	46.63
W. OCC. SURGE	1.89	20.00	3.85	10.53	5.00	0.00	0.00	0.00	0.00	3.28	6.87	33.87	7.03
W. OCC. CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. NO. OBS.	53.	50.	52.	57.	60.	59.	62.	62.	59.	61.	60.	62.	697.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-.20	-.40	.03	-.39	.18	.02	-.19	.05	.05	.52	.08	.50	.03
GROSS MEAN	1.16	1.62	.99	.84	.86	.54	.42	.37	.69	.81	.53	1.43	.84
STD DEV	.84	1.16	.69	.90	1.03	.48	.85	.36	.63	.65	.37	1.10	.81
NO. OBS.	29.	24.	28.	29.	30.	30.	32.	31.	30.	31.	30.	31.	355.
FORESHORT SLOPE													
MEAN (DEG)	9.03	7.00	5.84	5.31	6.23	5.29	3.81	3.48	5.67	5.54	5.64	7.11	5.79
STD DEV	4.51	3.10	2.59	2.93	2.65	2.30	1.66	.77	2.07	1.40	1.95	3.47	2.96
NO. OBS.	30.	23.	25.	29.	30.	31.	31.	31.	30.	28.	28.	28.	344.
RIPS % OCC	18.33	20.00	22.41	18.97	13.33	13.56	17.74	20.97	25.00	20.51	33.33	11.29	20.37
MEAN SPAC.	41.64	285.00	142.54	170.91	197.50	253.75	103.36	138.46	105.00	117.90	106.25	217.14	156.04
NO. OBS.	60.	50.	50.	59.	60.	59.	62.	62.	60.	61.	60.	62.	712.
CUSPS % OCC.	15.00	7.64	46.55	46.55	43.33	40.68	16.13	25.81	45.00	49.18	43.33	30.36	36.02
MEAN SPAC.	141.44	243.00	157.41	182.07	182.92	132.63	133.80	111.24	108.93	163.20	147.23	319.06	170.66
NO. OBS.	40.	52.	56.	58.	60.	59.	62.	62.	60.	61.	60.	56.	708.

5020 GOAT ROCK CALIFORNIA SUMMARY FOR PERIOD STARTING 1-1-70 AND ENDING 12-31-70.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)	5.23	4.91	4.73	4.53	3.78	3.60	3.27	3.13	3.75	4.58	4.05	4.11	4.36
MEAN	1.97	1.88	1.81	1.51	.89	.95	.78	.78	1.27	2.33	1.85	2.37	1.78
STD DEV	.62	.55	.50	.59	.59	.56	.59	.61	.53	.59	.53	.57	.691
NO. OBS.													
<b>PERIOD (SEC)</b>													
WAL	11.95	12.71	12.51	11.20	10.06	11.32	9.65	10.30	11.34	12.43	11.16	12.25	11.46
STD DEV	1.35	1.54	2.10	1.39	1.18	2.55	2.23	1.91	1.84	2.59	1.36	2.03	2.09
NO. OBS.	62	55	50	59	59	56	59	61	59	59	52	57	695
<b>DIRECTION</b>													
<b>COASTAL SECTION</b>													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00	.21
2	0.00	0.00	0.00	0.00	1.67	1.79	1.75	5.08	3.85	3.45	12.77	9.26	4.47
3	0.00	0.00	0.00	59.26	66.67	43.93	91.23	71.19	71.15	86.21	82.98	87.04	76.72
4	0.00	0.00	0.00	40.74	31.67	14.29	7.02	23.73	23.08	10.34	4.26	3.70	16.60
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0	0	0	27	60	56	57	59	52	56	47	54	470
<b>CUMPASS SECTION</b>													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	25.81	20.37	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00
SE	74.19	79.63	43.93	45.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00
SW	0.00	0.00	7.14	10.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
CAL	0.00	0.00	0.00	3.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	62	54	50	28	0	0	0	0	0	0	0	0	200
<b>BREAKER TYPE</b>													
SOCC SPILL	69.35	77.78	78.57	55.93	60.00	32.14	45.76	37.70	37.78	12.07	11.54	21.03	45.27
SP/PL	0.00	0.00	0.00	22.03	28.33	17.86	15.25	26.23	35.65	51.72	53.85	12.28	21.69
PLUNGE	24.19	14.81	17.86	11.67	50.00	50.00	36.98	39.43	26.42	34.48	28.85	47.37	29.11
SURGE	6.45	7.41	3.57	1.69	0.00	0.00	0.00	0.00	0.00	1.72	5.77	19.30	3.93
CAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	42	54	36	59	60	56	59	61	53	58	52	57	681
<b>CURRENT OBS.</b>													
(FT/SEC)	.12	-.17	-.33	-.30	-.29	.13	-.06	.38	.39	.13	.13	-.04	-.03
NET MEAN													
GROSS MEAN	.76	1.08	.68	.61	.74	.68	.56	.61	.75	.88	1.11	1.02	.91
STD DEV	.80	1.00	.40	.65	.46	.83	.57	.53	.70	.66	.78	.86	.67
NO. OBS.	31	27	30	28	30	31	30	31	26	29	25	30	350
<b>FORESHORE SLOPE</b>													
MEAN (DEG)	6.00	5.18	4.17	4.68	5.89	5.89	6.03	6.07	5.62	6.24	6.04	5.50	5.61
STD DEV	2.02	1.70	1.39	1.46	1.26	1.40	1.54	.98	.57	1.86	1.60	1.07	1.56
NO. OBS.	28	28	30	25	28	28	30	30	26	29	24	28	314
<b>RIPS 3 UCC</b>													
MEAN SPAC.	220.00	5.45	3.45	8.47	16.67	12.07	3.39	12.70	16.36	16.95	5.56	0.00	9.18
NO. OBS.	62	146.67	150.00	139.00	62.70	87.14	100.00	87.25	105.00	134.50	370.67	0.00	132.40
NO. OBS.		55	58	59	60	58	59	61	55	59	54	57	699
<b>CUSPS 4 OCC.</b>													
MEAN SPAC.	172.81	18.18	8.62	11.86	26.67	15.52	20.34	28.57	30.91	38.98	46.30	35.09	24.07
NO. OBS.	61	181.30	183.00	104.66	85.13	79.69	122.75	104.50	112.53	144.13	168.48	280.90	102.65
NO. OBS.		59	58	59	60	56	59	61	55	59	54	57	698

# SUMMARY FOR PERIOD STARTING 1-1-71 AND ENDING 12-31-71.

## 5020 GUAT ROCK

## CALIFORNIA

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF HRS.													
HEIGHT (FT)													
MEAN	5.48	6.78	5.63	4.41	4.03	3.67	3.00	3.83	3.71	4.04	5.32	4.77	4.98
STD DEV	2.51	2.18	2.27	.87	.81	1.21	.67	1.84	1.63	1.02	2.36	1.27	1.93
NO. OBS.	33.	27.	30.	29.	30.	30.	28.	23.	28.	23.	28.	26.	335.
PERIOD (SEC)													
MEAN	12.58	12.35	12.63	11.21	10.85	10.92	9.58	11.11	10.96	11.33	11.49	10.94	11.34
STD DEV	2.00	1.87	1.53	1.17	1.16	3.46	2.77	1.79	1.39	1.07	1.53	1.17	2.08
NO. OBS.	31.	26.	31.	29.	30.	30.	29.	24.	28.	24.	29.	26.	337.

## DIRECTION

## COASTAL SECTOR

0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	6.25	5.00	0.00	0.00	0.00	0.00	3.57	5.00	0.00	0.55	7.14	19.23	4.09
3	93.75	90.00	80.00	100.00	86.21	85.19	89.29	85.00	92.59	95.45	78.57	65.38	86.79
4	0.00	5.00	20.00	0.00	13.79	14.81	7.14	10.00	7.41	0.00	14.29	15.38	9.12
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	32.	20.	30.	29.	29.	27.	28.	20.	27.	22.	28.	26.	318.

## BREAKER TYPE

TOCC SPILL	15.15	7.41	19.35	40.78	41.38	43.33	31.03	47.83	21.43	54.17	42.86	23.08	31.64
SP/PL	9.09	7.41	35.44	25.93	44.83	23.33	27.59	30.43	17.86	25.00	32.14	42.31	26.57
PLUNGE	75.76	70.37	35.44	33.33	13.79	35.33	37.93	21.74	50.00	20.83	14.29	30.77	37.31
RUNGE	0.00	10.81	9.68	0.00	0.00	0.00	3.45	0.00	10.71	0.00	10.71	3.85	4.48
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	33.	27.	31.	27.	29.	30.	29.	23.	28.	24.	28.	26.	335.

## CURRENT OBS.

(FT/SEC)													
NET MEAN	.14	-.16	-.09	-.35	-.20	.01	-.09	-.16	-.20	-.45	-.34	.26	-.13
GROSS MEAN	.83	.61	.81	.57	.94	.63	.58	.86	.81	.59	.78	.86	.74
STD DEV	.82	.65	.81	.43	.48	.43	.65	.64	.85	.41	.56	.66	.62
NO. OBS.	29.	26.	28.	29.	30.	29.	29.	24.	28.	22.	28.	25.	327.

## FORESHORE SLOPE

MEAN (OCC)	6.52	6.27	5.96	5.69	6.24	6.43	6.18	5.71	6.21	6.13	6.96	6.77	6.25
STD DEV	2.16	2.20	1.19	.60	1.09	1.25	.98	1.08	1.47	1.01	1.49	1.02	1.40
NO. OBS.	29.	26.	27.	29.	29.	30.	28.	24.	28.	23.	25.	22.	320.
RIPS													
MEAN SPAC.	3.03	0.00	0.00	6.90	0.00	3.33	6.90	12.50	0.00	4.17	10.34	7.69	4.41
NO. OBS.	33.	27.	31.	29.	30.	30.	29.	24.	28.	24.	29.	26.	80.65
CUSPS													
MEAN SPAC.	84.85	70.37	74.19	75.86	76.67	76.67	68.97	75.00	71.43	79.17	93.10	96.15	78.53
NO. OBS.	33.	27.	31.	29.	30.	30.	29.	24.	28.	24.	29.	26.	149.80

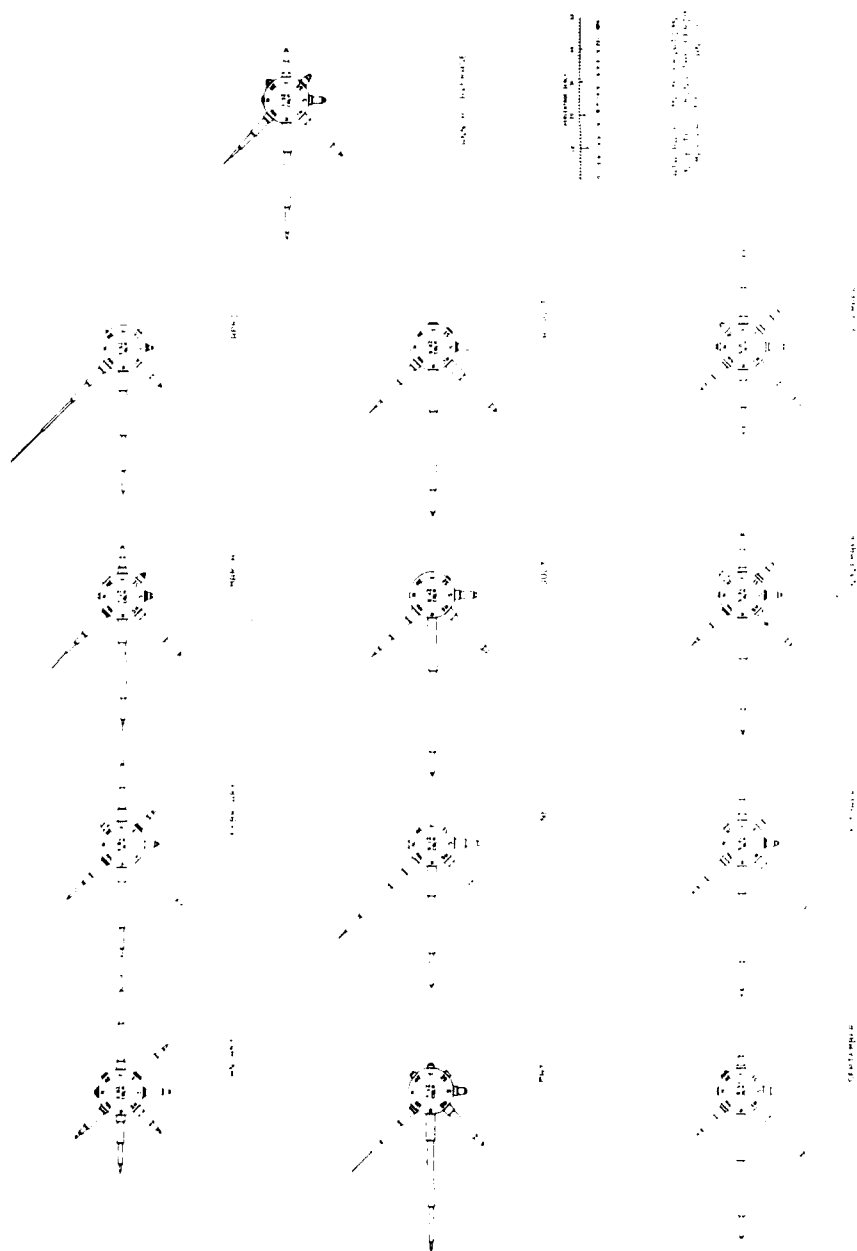
5020 GOAT ROCK CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 1-72 AND ENDING 12-31-72.

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
WEIGHT (MT)													
MEAN	5.17	4.61	5.29	4.74	3.48	3.64	3.00	3.63	3.19	4.38	7.28	5.85	4.47
STD DEV	1.59	1.20	2.23	1.63	.99	1.10	1.02	1.33	.80	1.50	2.42	2.74	2.00
NO. OBS.	23.	28.	28.	27.	29.	28.	30.	30.	26.	26.	25.	27.	327.
PERIOD (SEC)													
MEAN	11.47	11.66	13.42	11.54	10.59	11.33	15.17	12.00	11.02	11.37	12.39	11.81	12.01
STD DEV	7.64	7.81	5.22	2.58	1.40	1.45	5.91	4.38	1.51	1.32	2.59	3.60	3.51
NO. OBS.	28.	28.	28.	28.	28.	29.	29.	30.	26.	26.	25.	27.	329.
DIRECTION													
COASTAL SECTION													
NO. OBS.	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	0.00	3.85	0.00	0.00	.62
2	0.00	18.29	6.98	14.29	3.70	3.57	20.00	3.33	8.00	30.77	17.39	3.70	10.49
3	73.91	78.57	72.41	57.14	74.07	78.57	66.67	86.67	80.00	53.85	69.57	88.89	73.46
4	26.09	7.14	20.69	28.57	22.22	17.86	6.67	10.00	12.00	11.54	13.04	7.41	15.12
5	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	.31
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	23.	28.	29.	28.	27.	28.	30.	30.	25.	26.	23.	27.	328.
BREAKER TYPE													
RUCC SPILL	8.33	3.70	13.79	7.14	6.90	20.69	20.69	13.33	0.00	0.00	4.00	0.00	8.51
SPILL	41.67	62.96	55.17	60.71	68.97	48.28	24.14	43.33	50.00	42.31	48.00	81.88	52.28
PLUNGE	37.50	33.33	20.69	32.14	20.69	31.03	27.59	28.00	42.31	50.00	16.00	11.11	28.27
SLICE	12.50	0.00	10.38	0.00	3.45	0.00	27.59	23.33	7.69	7.69	32.00	7.41	10.94
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	27.	29.	28.	29.	29.	29.	30.	26.	26.	25.	27.	329.
CURRENT OBS.													
(FT/SEC)													
MEAN	0.22	0.00	0.01	0.42	0.30	0.18	0.03	0.78	0.12	0.79	0.05	0.34	.13
STD DEV	.97	.68	.74	.83	.69	1.07	1.32	1.50	1.07	1.14	.78	.63	.96
NO. OBS.	28.	28.	29.	28.	26.	28.	30.	30.	26.	25.	24.	27.	325.
FORTSHORE SLOPE													
MEAN (DEG)	7.09	6.86	6.15	6.04	6.37	6.38	6.00	6.43	6.84	7.04	5.91	5.15	6.34
STD DEV	1.28	1.51	1.77	1.95	.79	1.27	1.68	1.35	1.80	1.89	1.48	.86	1.97
NO. OBS.	23.	28.	27.	26.	27.	29.	30.	28.	25.	26.	23.	27.	319.
RIPS & ICC													
MEAN SPAC.	0.00	10.71	31.03	25.00	6.90	10.34	51.61	6.67	3.85	11.54	24.00	0.00	15.66
NO. OBS.	28.	28.	29.	28.	29.	29.	31.	30.	26.	100.00	128.33	0.00	105.24
CUSPS & ICC													
MEAN SPAC.	100.00	96.83	93.10	89.29	82.78	89.66	83.87	96.67	65.38	76.92	100.00	88.89	88.55
NO. OBS.	28.	28.	29.	28.	29.	29.	31.	30.	26.	180.60	208.20	155.79	152.09

SUMMARY FOR PERIOD STARTING 1- 1-73 AND ENDING 1-31-73.											
CALIFORNIA											
5020 GOAT ROCK											
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
SURF OBS.											
HEIGHT (FT)	6.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PERIOD (SEC)											
MEAN	10.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DIRECTION											
COASTAL SECTOR											
0 DEC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	17.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	76.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
BREAKER TYPE											
XUCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/PL	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SURGE	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CURRENT OBS.											
(FT/SEC)											
NET MEAN	.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GROSS MEAN	.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
FURROWS SLOPE											
MEAN (NEW)	5.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RIPS											
MEAN SPAC.	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CUSPS											
MEAN SPAC.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	207.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

# CHLIFORNIA

## WIND MODEL US020 GOAT ROCK





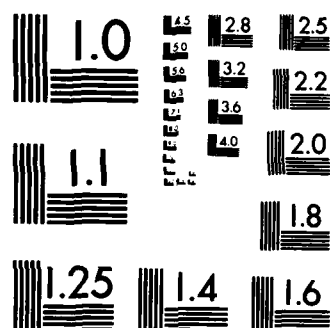


5021 WRIGHT'S BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 5-1-68 AND ENDING 12-31-68.												
SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
MEAN	0.00	0.00	0.00	0.00	3.65	3.67	3.53	3.93	4.20	5.59	5.83	5.12
STD DEV	0.00	0.00	0.00	0.00	1.27	1.00	1.06	1.91	1.74	1.66	2.37	2.44
NO. OBS.	0.	0.	0.	0.	60.	50.	60.	50.	50.	50.	50.	466.
PERIOD (SEC)												
MEAN	0.00	0.00	0.00	0.00	10.17	9.25	9.21	10.41	9.81	11.80	11.80	10.46
STD DEV	0.00	0.00	0.00	0.00	1.79	1.65	1.07	2.23	1.57	1.30	1.67	2.00
NO. OBS.	0.	0.	0.	0.	60.	50.	60.	50.	50.	50.	48.	460.
DIRECTION												
COMPASS SECTION												
0 DEC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	526	53.	61.	52.	57.	50.	49.	435.
BREAKER TYPE												
LONG SPILL	0.00	0.00	0.00	0.00	81.36	85.19	92.31	71.70	66.67	39.29	54.39	45.45
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	10.60	14.81	7.69	28.30	33.33	58.93	43.86	45.45
SHOULDER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	1.75	9.09
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	59.	50.	65.	53.	57.	56.	57.	456.
CURRENT OBS.												
(FT/SEC)												
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.15	0.21	0.12	0.20	0.18	0.47	0.23
GROSS MEAN	0.00	0.00	0.00	0.00	0.40	0.46	0.50	0.40	0.72	0.70	0.82	0.93
STD DEV	0.00	0.00	0.00	0.00	0.65	0.66	0.60	0.48	0.60	0.71	0.88	0.70
NO. OBS.	0.	0.	0.	0.	31.	30.	38.	30.	33.	33.	33.	283.
FURFSHORE SLOPE												
MEAN (NEG)	0.00	0.00	0.00	0.00	7.96	9.72	7.35	5.96	9.79	7.78	7.21	7.13
STD DEV	0.00	0.00	0.00	0.00	4.40	4.32	3.20	3.72	4.25	3.96	4.48	4.04
NO. OBS.	0.	0.	0.	0.	27.	32.	37.	26.	28.	32.	33.	246.
RIPS & OCC												
MEAN SPAC.	0.00	0.00	0.00	0.00	3.33	0.00	1.52	9.03	5.08	16.95	12.07	20.69
NO. OBS.	0.	0.	0.	0.	60.	56.	66.	53.	59.	59.	58.	469.
CUSPS & OCC.												
MEAN SPAC.	0.00	0.00	0.00	0.00	46.67	50.00	45.05	44.04	45.76	40.68	50.00	53.45
NO. OBS.	0.	0.	0.	0.	60.	56.	60.	50.	59.	59.	58.	470.

UNCLASSIFIED

LITTORAL ENVIRONMENT OBSERVATION (LEO) DATA SUMMARIES  
NORTHERN CALIFORNIA 1968-78(U) COASTAL ENGINEERING  
RESEARCH CENTER FORT BELVOIR VA C SCHNEIDER ET AL.  
AUG 82 CERC-MR-82-6 F/G 5/1

NL



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

S021 WHIGHTS HEAD CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 1-69 AND ENDING 12-31-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	5.33	6.40	5.33	5.27	4.81	3.36	3.52	3.25	4.12	5.25	4.97	7.76	4.94
STD DEV	2.05	2.16	1.23	1.15	1.58	.85	1.32	.84	1.47	1.50	2.30	2.74	2.10
NO. OBS.	61.	33.	61.	55.	59.	59.	60.	60.	59.	60.	60.	62.	709.
PERIOD (SEC)													
MEAN	10.71	12.32	12.50	11.59	11.23	10.73	9.18	9.20	10.94	12.23	12.27	13.56	11.37
STD DEV	1.19	1.95	1.27	2.30	1.71	2.23	2.14	1.82	1.60	1.80	1.81	2.14	2.24
NO. OBS.	62.	33.	61.	56.	59.	59.	61.	59.	59.	59.	59.	62.	709.
DIRECTION													
COMPASS SECTOR													
OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	16.94	12.24	1.69	3.57	15.25	3.57	3.33	0.00	5.00	0.00	3.39	11.48	0.00
W	77.56	63.27	94.31	96.43	43.05	69.29	96.67	96.33	95.00	100.00	96.61	84.52	90.75
NW	5.66	24.49	0.00	0.00	1.69	7.14	0.00	1.67	0.00	0.00	0.00	0.00	3.03
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	53.	49.	59.	56.	59.	59.	60.	60.	60.	60.	59.	61.	692.
HRAIR TYPE													
TOCC SPILL	48.15	28.00	26.07	48.21	57.63	44.07	75.41	90.00	70.00	73.33	61.67	29.03	56.49
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	44.44	52.00	65.00	39.29	37.29	54.24	24.59	10.00	30.00	20.00	15.00	41.94	35.81
SURGE	7.41	20.00	6.33	12.50	5.08	1.69	0.00	0.00	0.00	6.67	3.33	29.03	7.70
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	54.	50.	60.	56.	59.	59.	61.	60.	60.	60.	60.	62.	701.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-0.34	-0.06	-0.35	-0.37	.14	-0.17	-0.15	-0.03	-0.16	.10	.01	.08	-0.11
GROSS MEAN	1.34	1.26	1.10	.92	.58	.04	.40	.42	.58	.74	.43	1.10	.78
STD DEV	.81	.85	.74	.84	.73	.44	.29	.30	.50	.83	.36	.71	.72
NO. OBS.	30.	27.	31.	27.	29.	29.	30.	30.	29.	30.	30.	30.	352.
FURSHORE SLOPE													
MEAN (D/G)	9.03	6.63	6.65	6.40	6.14	7.07	5.63	4.79	4.83	5.55	8.21	6.90	6.49
STD DEV	3.53	3.04	2.50	2.71	2.59	3.66	1.79	1.85	1.97	1.59	2.72	1.56	2.79
NO. OBS.	30.	20.	31.	25.	29.	29.	30.	24.	30.	29.	29.	30.	344.
RIPS & OCC													
MEAN SPAC.	14.52	19.23	19.67	21.43	13.56	6.78	4.92	3.33	11.67	23.33	31.67	14.52	15.31
NO. OBS.	62.	52.	61.	56.	59.	59.	61.	60.	60.	60.	60.	62.	712.
CUSPS & OCC.													
MEAN SPAC.	45.14	50.94	50.82	53.57	50.85	40.68	9.44	6.67	28.33	46.67	45.00	50.00	39.69
NO. OBS.	62.	53.	61.	56.	59.	59.	61.	60.	60.	60.	60.	62.	713.

# SUMMARY FOR PERIOD STARTING 1-1-70 AND ENDING 12-31-70.

## CALIFORNIA

## SEA WINDS WAVE

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WIND (FT)													
MEAN	5.32	5.07	5.27	4.55	3.75	3.41	3.17	1.20	3.00	4.41	5.04	6.29	4.44
STD DEV	2.57	2.02	1.57	1.65	1.80	1.00	1.59	.82	1.41	1.87	1.74	3.06	1.93
NO. OBS.	42.	54.	54.	54.	54.	54.	54.	54.	54.	59.	54.	54.	492.
PERIOD (SEC)													
MEAN	11.97	12.80	12.06	11.19	10.67	11.34	9.52	10.44	11.32	12.04	11.27	11.92	11.43
STD DEV	1.31	1.34	2.05	1.30	1.17	2.01	1.99	2.23	1.65	2.23	1.56	2.29	2.00
NO. OBS.	42.	54.	54.	54.	61.	54.	54.	54.	54.	61.	54.	57.	701.
DIRECTION													
CHASTAL SECTOR													
0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	3.	0.	30.	54.	54.	54.	54.	54.	60.	54.	51.	479.
COMPASS SECTOR													
0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	3.	0.	30.	54.	54.	54.	54.	54.	60.	54.	51.	479.
BREAKER TYPE													
NOCC SPILL	75.81	71.93	77.59	62.07	60.10	42.11	50.88	50.00	44.64	7.14	16.98	30.36	50.22
SP/PL	0.00	3.51	0.00	17.24	22.03	22.81	15.79	24.14	20.57	60.71	52.43	8.93	20.96
PLUNGE	20.97	17.54	18.97	14.97	11.86	33.33	33.33	25.66	26.79	32.14	24.53	39.29	25.18
SURGE	3.23	7.02	3.45	1.72	0.00	1.75	0.00	0.00	0.00	0.00	5.66	21.43	3.64
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	42.	57.	54.	54.	54.	57.	57.	54.	54.	54.	54.	54.	487.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	.29	.13	.31	.42	.33	.40	.14	.41	.02	.21	.16	.55	.02
GROSS MEAN	.77	.97	.79	.84	.71	.93	.53	.65	.74	.97	1.09	1.03	.83
STD DEV	.49	.56	.54	.51	.47	.92	.57	.68	.85	.69	.69	.79	.61
NO. OBS.	11.	28.	11.	28.	31.	31.	30.	31.	29.	31.	28.	31.	360.
FUNCTIONS SLOPE													
MEAN (DEC)	5.70	6.07	5.96	7.18	6.94	7.32	7.03	6.20	5.93	6.58	6.96	7.72	6.64
STD DEV	1.26	1.92	2.01	2.42	2.31	2.18	1.59	1.27	.81	2.29	2.24	1.89	1.98
NO. OBS.	10.	28.	26.	28.	31.	31.	30.	30.	28.	31.	28.	29.	350.
RIPS & OCC	24.19	20.69	25.84	13.79	1.84	6.90	3.39	1.72	10.71	14.75	3.57	3.45	10.95
MEAN SPAC.	120.33	135.00	171.33	155.50	60.00	91.78	62.00	55.00	77.50	105.00	150.00	125.00	108.94
NO. OBS.	42.	54.	54.	54.	61.	54.	54.	54.	54.	61.	54.	54.	703.
CUSPS & OCC	63.55	41.18	46.55	44.43	34.45	37.93	18.64	20.69	46.43	49.18	50.00	51.72	40.40
MEAN SPAC.	170.67	190.43	210.67	234.35	223.28	170.45	119.00	189.75	171.65	98.20	136.32	164.70	173.23
NO. OBS.	42.	54.	54.	54.	61.	54.	54.	54.	54.	61.	54.	54.	703.

5021 RIGHTIS BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 1-71 AND ENDING 12-31-71.

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	5.03	6.50	5.77	4.43	4.20	3.77	3.10	3.77	4.43	3.72	5.07	4.41	4.55
STD DEV	1.88	2.13	2.24	.88	.92	1.14	.72	2.20	2.73	.98	2.12	1.28	1.95
NO. OBS.	34.	28.	30.	28.	30.	30.	29.	22.	28.	25.	30.	27.	341.
PERIOD (SEC)													
MEAN	12.87	12.35	11.93	11.29	10.85	10.26	10.10	11.23	10.80	11.51	11.15	10.65	11.29
STD DEV	2.44	2.93	1.63	1.48	1.07	1.89	3.40	1.41	1.85	1.82	1.28	1.19	2.09
NO. OBS.	34.	28.	30.	28.	30.	30.	29.	23.	28.	26.	30.	26.	342.
DIRECTION													
COASTAL SECTOR													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3.23	0.00	0.00	3.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	93.55	95.65	72.41	92.86	85.19	90.00	93.10	90.00	92.31	96.15	86.21	65.38	87.65
4	3.23	4.35	27.59	3.57	14.81	10.00	6.90	5.00	7.69	0.00	6.90	15.38	8.95
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	31.	23.	29.	28.	27.	30.	29.	20.	28.	26.	29.	26.	324.
BREAKER TYPE													
BOCC SPILL	24.28	14.29	20.69	44.44	62.07	46.67	41.38	36.36	25.00	42.31	50.00	34.62	36.72
SP/PL	15.15	21.43	37.93	25.93	24.14	33.33	37.93	50.00	32.14	42.31	17.86	38.46	38.75
PLUNGE	57.58	57.14	34.44	14.81	13.79	20.00	20.69	13.64	28.57	15.38	21.43	23.08	27.46
SURGE	3.03	7.14	6.90	14.81	0.00	0.00	0.00	0.00	14.29	0.00	10.71	3.85	5.07
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	33.	28.	29.	27.	29.	30.	29.	22.	28.	26.	28.	26.	335.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-0.39	-0.52	-0.43	-0.30	-0.47	-0.19	-0.10	-0.20	-0.43	-0.66	-0.29	-0.09	-0.34
GROSS MEAN	.71	.81	.78	.76	1.04	.68	.77	1.03	.81	.69	.69	.88	.79
STD DEV	.78	.80	.45	.80	.58	.49	.60	.75	.78	.39	.53	.75	.62
NO. OBS.	30.	28.	27.	28.	30.	29.	29.	23.	28.	26.	30.	27.	335.
FORESHORE SLOPE													
MEAN (DEG)	7.87	7.76	7.46	6.54	7.57	7.10	7.45	6.52	6.36	6.80	7.00	7.81	7.20
STD DEV	4.11	3.88	1.86	1.75	1.89	2.16	1.94	1.44	1.37	.76	1.41	1.30	2.25
NO. OBS.	30.	25.	28.	28.	28.	29.	29.	21.	28.	25.	28.	26.	325.
RIPS & HCC													
MEAN (DEG)	0.00	0.00	13.33	14.29	0.00	6.67	10.34	13.04	14.29	3.85	10.00	25.93	9.04
STD DEV	0.00	0.00	16.00	73.75	0.00	95.50	98.33	371.33	83.00	123.00	150.00	116.43	100.49
NO. OBS.	30.	28.	30.	28.	30.	30.	29.	23.	28.	26.	30.	27.	343.
CUSPS & OCC.													
MEAN (DEG)	88.28	100.00	93.33	92.86	100.00	80.00	68.97	95.45	75.00	76.92	100.00	100.00	89.18
STD DEV	155.57	148.43	109.64	122.08	143.23	143.17	167.65	150.38	133.86	110.10	145.00	136.15	142.55
NO. OBS.	34.	28.	30.	28.	30.	30.	29.	22.	28.	26.	30.	27.	342.

5021 WRIGHT'S BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 1-72 AND ENDING 12-31-72.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WFLIGHT (FT)													
MEAN	4.81	4.76	5.18	4.71	5.63	3.86	3.35	3.90	3.27	4.47	7.12	5.04	4.48
STD DEV	1.69	1.43	1.65	1.58	1.00	1.19	.91	1.12	.72	1.68	2.39	2.22	1.81
NO. OBS.	27.	29.	28.	28.	30.	29.	31.	30.	26.	30.	26.	26.	340.
PERIOD (SEC)													
MEAN	11.54	11.70	12.76	12.16	12.13	11.88	15.31	11.97	11.22	11.97	12.82	11.60	12.28
STD DEV	1.89	2.59	0.21	4.08	3.57	2.70	4.80	4.29	1.64	2.55	2.25	3.99	3.50
NO. OBS.	27.	29.	28.	28.	30.	29.	30.	30.	26.	30.	26.	26.	339.
DIRECTION													
COASTAL SECTOR													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3.85	20.69	7.14	14.81	3.33	0.00	16.13	13.33	3.85	30.00	16.00	4.00	11.31
3	84.62	72.41	49.29	59.26	73.33	82.76	77.42	83.33	84.62	56.67	80.00	92.00	77.68
4	11.54	6.90	3.57	25.93	23.33	17.24	6.45	3.33	11.54	13.33	4.00	4.00	11.01
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	26.	29.	28.	27.	30.	29.	31.	30.	26.	30.	25.	25.	336.
BREAKER TYPE													
NOCC SPILL	25.93	6.90	13.79	25.00	23.33	17.24	29.03	10.00	7.69	0.00	3.85	0.00	13.78
SP/PL	33.33	62.07	40.83	57.14	66.67	55.17	29.03	53.33	65.38	53.33	46.15	84.62	53.96
PLUNGE	29.63	31.03	17.24	14.29	10.00	27.99	35.48	30.00	23.08	46.67	19.23	7.69	24.63
SURGE	11.11	0.00	24.14	3.57	0.00	0.00	6.45	6.67	3.85	0.00	30.77	7.69	7.62
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	27.	29.	29.	28.	30.	29.	31.	30.	26.	30.	26.	26.	341.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-0.45	-0.14	-0.32	-0.29	-0.18	-0.40	-0.11	-0.33	-0.39	-0.08	-0.02	-0.06	-0.14
GROSS MEAN	.88	.61	.79	.93	.83	.86	1.11	1.09	.76	1.09	.81	.60	.87
STD DEV	.53	.42	.49	.47	.56	.49	.78	.84	.63	.79	.75	.81	.63
NO. OBS.	27.	29.	29.	28.	30.	29.	30.	29.	26.	30.	26.	26.	338.
FRESHORE SLOPE													
MEAN (DEG)	8.42	6.81	7.04	7.56	7.40	6.90	7.76	7.20	7.85	7.17	5.92	5.28	7.13
STD DEV	1.98	1.52	1.55	2.47	1.77	1.03	1.53	1.94	1.97	1.46	1.38	.79	1.02
NO. OBS.	26.	28.	28.	27.	30.	30.	29.	30.	26.	30.	24.	25.	331.
RIPS													
% OCC	0.00	0.00	24.14	25.00	13.33	16.67	51.61	26.67	19.23	13.33	15.38	7.69	18.18
MEAN SPAC.	0.00	0.00	109.43	140.71	141.75	206.00	153.19	129.25	113.20	134.25	148.50	80.00	114.62
NO. OBS.	27.	28.	29.	28.	30.	30.	31.	30.	26.	30.	26.	26.	341.
CUSPS													
% OCC.	100.00	93.10	93.10	89.29	86.67	86.67	83.87	93.33	80.77	90.00	100.00	92.31	90.64
MEAN SPAC.	136.26	134.01	123.81	100.24	160.77	162.54	169.00	158.18	137.67	143.70	216.62	176.54	184.50
NO. OBS.	27.	29.	29.	28.	30.	30.	31.	30.	26.	30.	26.	26.	342.

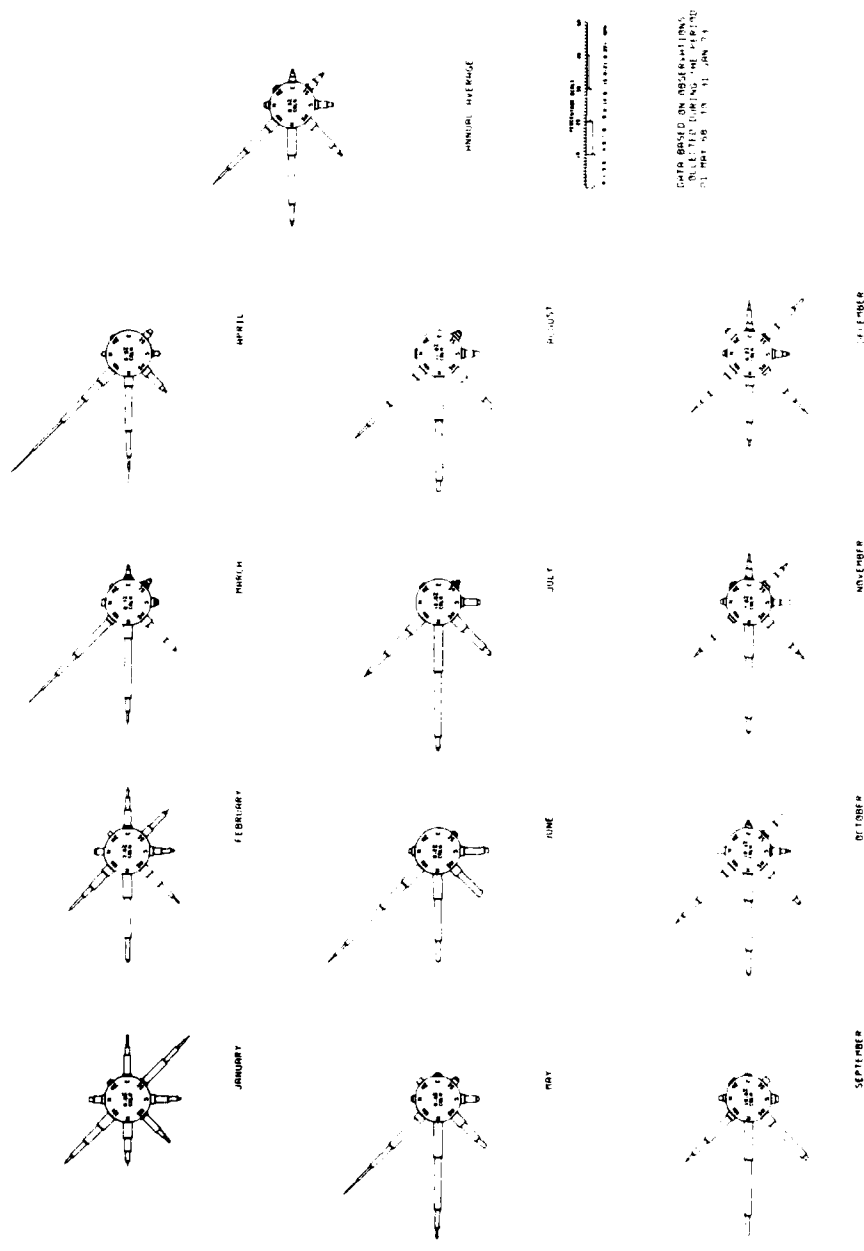


5021 WRIGHT IS BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 2-73 AND ENDING 1-31-73.

SURF OBS. WEIGHT (FT)	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
MEAN	5.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.08
STD DEV	2.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
PERIOD (SEC)													
MEAN	10.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.39
STD DEV	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
DIRECTION													
COASTAL SECTION													
1 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33
3	91.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.67
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
BREAKER TYPE													
BOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/PL	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.00
PLUNGE	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50
SURGE	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
CURRENT OBS. (FT/SEC)													
NET MEAN	-0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.18
GROSS MEAN	.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.74
STD DEV	.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.80
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
FORESHORE SLOPE													
MEAN (DEC)	5.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.25
STD DEV	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
RIPS % OCC	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17
MEAN SPAC.	246.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	246.00
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
CUSPS % OCC.	95.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	95.83
MEAN SPAC.	220.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	220.91
NO. OBS.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.

# CALIFORNIA

## WIND ROSES (500) WRIGHT'S



# SUMMARY FOR PERIOD STARTING 7-10-70 AND ENDING 9- 6-70.

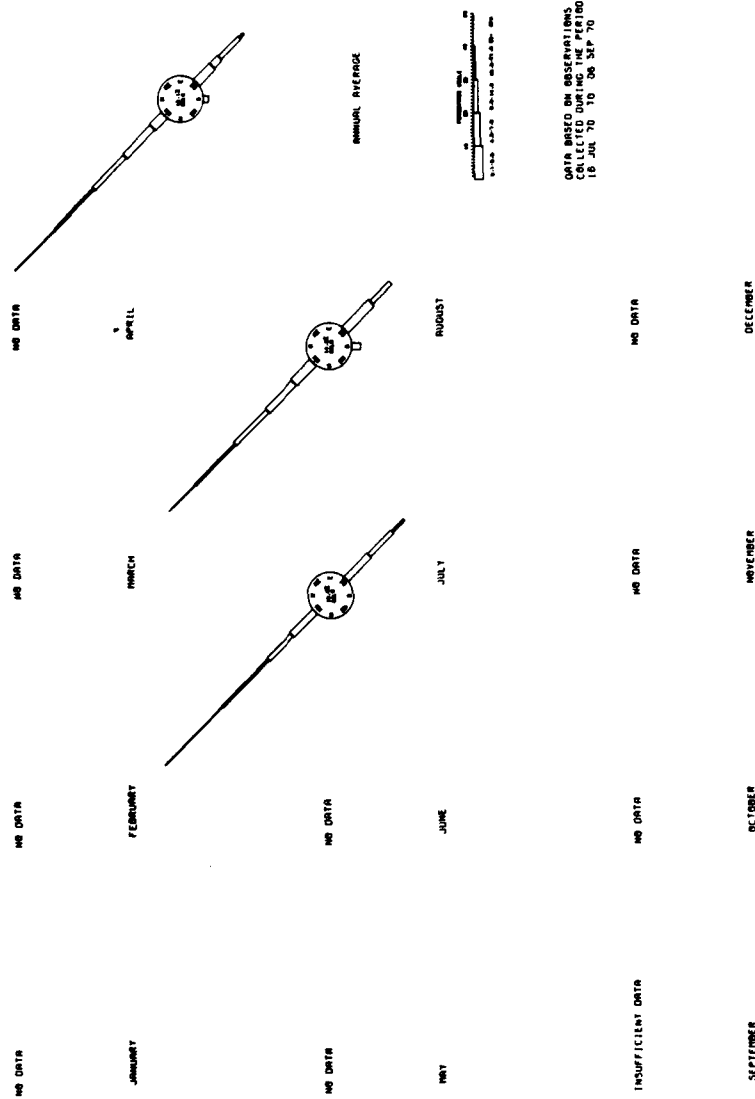
## CALIFORNIA

## SUSS DRANE IS BEACH

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WEIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	1.47	2.19	2.00	0.00	0.00	0.00	1.95
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	1.17	1.04	0.82	0.00	0.00	0.00	1.11
NO. OBS.	0.	0.	0.	0.	0.	0.	19.	34.	4.	0.	0.	0.	59.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	18.77	14.89	15.68	0.00	0.00	0.00	16.17
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	6.73	1.11	1.36	0.00	0.00	0.00	4.22
NO. OBS.	0.	0.	0.	0.	0.	0.	18.	34.	4.	0.	0.	0.	57.
DIRECTION													
COASTAL SPECTRUM													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.86	0.00	0.00	0.00	0.00	1.72
3	0.00	0.00	0.00	0.00	0.00	0.00	100.00	97.14	100.00	0.00	0.00	0.00	98.28
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	19.	34.	4.	0.	0.	0.	58.
WREAKER TYPE													
XUCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	20.00	19.44	0.00	0.00	0.00	0.00	18.33
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	13.33
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	40.00	80.56	100.00	0.00	0.00	0.00	68.33
SUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	20.	34.	4.	0.	0.	0.	60.
CURRENT OBS.													
(FI/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.00	.13	-.13	-.12	0.00	0.00	0.00	-.04
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	.44	.20	.39	0.00	0.00	0.00	.30
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	.52	.28	.30	0.00	0.00	0.00	.34
NO. OBS.	0.	0.	0.	0.	0.	0.	11.	19.	3.	0.	0.	0.	33.
FORESHORE SLOPE													
MEAN (DEC)	0.00	0.00	0.00	0.00	0.00	0.00	5.45	5.26	5.33	0.00	0.00	0.00	5.33
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	1.37	1.24	.58	0.00	0.00	0.00	1.22
NO. OBS.	0.	0.	0.	0.	0.	0.	11.	19.	3.	0.	0.	0.	33.
RIPS													
% OCC	0.00	0.00	0.00	0.00	0.00	0.00	45.00	50.00	75.00	0.00	0.00	0.00	50.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	70.89	70.50	61.00	0.00	0.00	0.00	70.00
NO. OBS.	0.	0.	0.	0.	0.	0.	20.	34.	4.	0.	0.	0.	60.
CUSPS & UCC.													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	45.00	38.33	75.00	0.00	0.00	0.00	58.33
NO. OBS.	0.	0.	0.	0.	0.	0.	20.	34.	4.	0.	0.	0.	60.

# CALIFORNIA

## WIND ROSES 5355 DRAKE'S BEACH



5500 HULL-45			CALIFORNIA												SUMMARY FOR PERIOD STARTING 4-30-68 AND ENDING 9-30-70											
			JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.											
SURF OBS.																										
HEIGHT (FT)																										
MEAN			4.02	4.27	1.96	1.88	1.81	1.43	2.15	2.17	2.45	2.85	3.04	3.45	2.45											
STD DEV			1.81	1.72	1.12	.62	.49	.56	.74	.71	.85	1.03	1.06	1.61	1.36											
NO. OBS.			60.	49.	24.	16.	77.	64.	81.	63.	74.	53.	54.	53.	648.											
PERIOD (SEC)																										
MEAN			11.81	11.87	12.50	14.10	14.44	13.79	15.07	14.27	14.47	14.32	13.04	11.63	13.56											
STD DEV			1.59	2.08	.71	0.00	1.59	2.44	1.52	2.42	1.53	2.18	1.23	2.21	2.40											
NO. OBS.			61.	45.	2.	1.	61.	54.	58.	46.	56.	53.	54.	54.	545.											
DIRECTION																										
COASTAL SECTOR																										
OCC. 1			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
OCC. 2			0.00	11.11	4.35	0.00	0.00	9.09	9.09	0.00	0.00	0.00	0.00	0.00	0.00											
OCC. 3			0.00	55.56	46.22	46.47	75.00	72.73	63.64	89.47	50.00	0.00	0.00	0.00	0.00											
OCC. 4			0.00	33.33	30.43	33.33	25.00	18.18	27.27	10.53	50.00	0.00	0.00	0.00	0.00											
OCC. 5			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
CALM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.			0.	9.	23.	15.	16.	11.	22.	19.	18.	0.	0.	0.	133.											
COMPASS SECTOR																										
OCC. N			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
OCC. NE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
OCC. E			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
OCC. SE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.30	9.09	0.00	0.00	0.00	0.00											
OCC. S			100.00	100.00	0.00	100.00	100.00	100.00	100.00	86.08	89.09	100.00	100.00	100.00	97.73											
OCC. SW			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	.19											
OCC. W			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
OCC. NW			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
CALM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.69	0.00	0.00	0.00	0.00	.30											
NO. OBS.			61.	40.	0.	1.	61.	54.	55.	43.	55.	52.	54.	52.	528.											
BREAKER TYPE																										
TOCC APPL.			0.00	2.04	4.35	31.25	9.33	6.15	16.25	20.43	5.41	0.00	0.00	0.00	7.29											
P/PPL			0.00	16.33	91.30	62.50	9.33	10.77	12.50	11.11	18.72	0.00	0.00	0.00	12.77											
PLUNGE			100.00	81.43	4.35	6.25	81.33	8.08	71.25	68.28	75.48	100.00	100.00	100.00	79.94											
BURGE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
CALM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.			61.	49.	23.	16.	75.	65.	86.	63.	74.	51.	51.	50.	658.											
CURRENT OBS.																										
(FT/SEC)																										
NET MEAN			-7.16	-2.26	-0.07	.17	.12	.35	.37	.92	.01	.30	.36	.42	.09											
GROSS MEAN			.48	.45	.18	.45	.45	.60	.77	.96	.58	.42	.44	.59	.57											
STD DEV			.38	.33	.20	.46	.25	.75	.72	.60	.54	.21	.27	.36	.52											
NO. OBS.			31.	29.	22.	16.	45.	36.	48.	46.	47.	26.	27.	26.	399.											
FORESHORE SLOPE																										
MEAN (D/G)			3.70	4.03	2.91	2.73	2.24	2.35	2.92	3.82	4.01	3.63	3.69	3.54	3.39											
STD DEV			.54	.94	.64	.80	1.00	.92	1.11	1.38	.97	.74	.55	.59	1.27											
NO. OBS.			27.	20.	22.	15.	45.	37.	48.	50.	47.	27.	26.	26.	399.											
RIPS & OCC			0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.13											
MEAN SPAC.			0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.			62.	49.	24.	16.	77.	66.	81.	63.	74.	53.	54.	54.	674.											
CURPS & OCC.			0.00	0.00	0.00	43.75	9.09	0.00	2.47	13.85	9.46	0.00	0.00	0.00	4.75											
MEAN SPAC.			0.00	0.00	0.00	81.43	70.00	0.00	40.00	78.33	80.00	0.00	0.00	0.00	31.07											
NO. OBS.			62.	49.	24.	16.	77.	65.	81.	63.	74.	53.	54.	54.	674.											



# 5500 RULINAS

## CALIFORNIA

SUMMARY FOR PERIOD STARTING 1- 1-69 AND ENDING 2-23-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	4.02	4.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.33
STD DEV	1.01	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.68
NO. OBS.	60.	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	100.
PERIOD (SEC)													
MEAN	11.01	11.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.62
STD DEV	1.59	2.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85
NO. OBS.	61.	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	101.
DIRECTION													
COMPASS SECTOR													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	61.	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	101.
BREAKER TYPE													
BOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
BURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	61.	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	101.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-0.16	-0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.24
GROSS MEAN	.48	.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.49
STD DEV	.38	.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.32
NO. OBS.	31.	21.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	52.
FRESHWATER SLOPE													
MEAN (D/G)	3.70	3.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73
STD DEV	.54	.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.57
NO. OBS.	27.	21.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	48.
RIPS													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	62.	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	102.
CUSPS													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	62.	40.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	102.

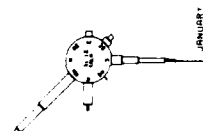
5500 ARLINAS CALIFORNIA SUMMARY FOR PERIOD STARTING 2-18-70 AND ENDING 9-30-70.

SURF OBS. HEIGHT (FT)	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
MEAN	0.00	1.09	1.96	1.87	1.56	1.82	1.81	1.95	1.72	0.00	0.00	0.00	1.79
STD DEV	0.00	.93	1.12	.64	.63	.60	.66	.62	.46	0.00	0.00	0.00	.74
NO. OBS.	0.	9.	24.	15.	16.	11.	23.	19.	16.	0.	0.	0.	135.
PERIOD (SEC)													
MEAN	0.00	16.20	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.14
STD DEV	0.00	5.02	.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.49
NO. OBS.	0.	5.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	7.
DIRECTION													
COASTAL SECTOR													
0 UCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	11.11	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	55.56	65.22	66.67	75.00	72.73	63.64	69.47	50.00	0.00	0.00	0.00	67.67
4	0.00	33.33	30.43	33.33	25.00	16.18	27.27	10.53	50.00	0.00	0.00	0.00	28.57
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	9.	23.	15.	16.	11.	22.	19.	16.	0.	0.	0.	133.
BREAKER TYPE													
TOCC SPILL	0.00	11.11	4.35	33.33	50.00	36.36	56.52	63.16	11.11	0.00	0.00	0.00	34.09
SP/PL	0.00	88.89	91.50	66.67	50.00	63.64	43.48	36.84	77.78	0.00	0.00	0.00	63.64
PLUNGE	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	2.27
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	9.	23.	15.	14.	11.	23.	19.	16.	0.	0.	0.	132.
CURRENT OBS. (FT/SEC)													
MEAN	0.00	-0.03	-0.07	.11	-0.20	.42	.17	1.10	-0.29	0.00	0.00	0.00	.15
STD DEV	0.00	.32	.18	.01	.57	1.08	1.10	1.16	.88	0.00	0.00	0.00	.72
NO. OBS.	0.	8.	22.	15.	14.	10.	19.	19.	16.	0.	0.	0.	125.
FORESHORE SLOPE													
MEAN (DEC)	0.00	4.75	2.91	2.79	3.33	2.10	2.55	3.11	5.17	0.00	0.00	0.00	3.28
STD DEV	0.00	1.28	.68	.80	1.05	.99	1.41	1.49	1.15	0.00	0.00	0.00	1.44
NO. OBS.	0.	8.	22.	14.	15.	10.	22.	19.	16.	0.	0.	0.	128.
RIPS % UCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.74
NO. OBS.	0.	9.	24.	15.	16.	11.	23.	19.	16.	0.	0.	0.	135.
CURPS % UCC													
MEAN SPAC.	0.00	0.00	0.00	44.67	43.75	0.00	8.70	47.37	18.89	0.00	0.00	0.00	23.70
NO. OBS.	0.	9.	24.	15.	16.	11.	23.	19.	16.	0.	0.	0.	135.

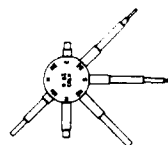


# CALIFORNIA

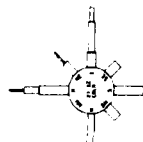
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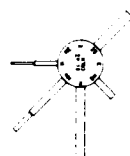
JANUARY



FEBRUARY



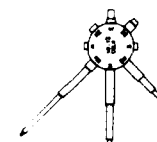
MARCH



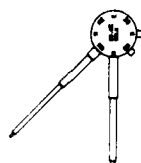
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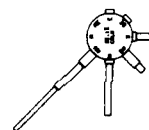
ANNUAL AVERAGE



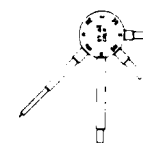
JUNE



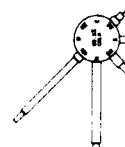
JULY



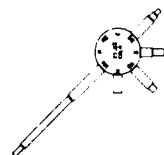
AUGUST



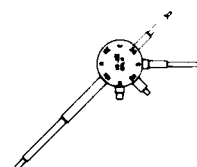
SEPTEMBER



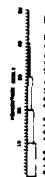
OCTOBER



NOVEMBER



DECEMBER



DATA BASED ON OBSERVATIONS  
COLLECTED FROM 1950 TO 1959  
ON MAY 68 TO 10 58 59

# 5022 STINSON BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 5-1-68 AND ENDING 9-30-73.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
WEIGHT (FT)	3.57	4.29	3.90	4.17	3.70	3.46	3.14	3.41	3.58	3.51	3.02	3.03	3.64
MEAN	1.38	1.29	1.02	1.81	.99	.96	.96	1.17	1.19	1.32	1.19	1.30	1.24
STD DEV	124.	87.	87.	88.	153.	145.	150.	140.	127.	132.	112.	86.	1031.
NO. OBS.													
<b>PERIOD (SEC)</b>													
MEAN	12.92	14.81	16.08	14.79	13.20	12.14	12.08	12.06	12.05	12.14	12.26	12.83	12.91
STD DEV	3.63	4.36	3.86	3.89	3.19	2.82	2.90	2.87	2.85	3.03	1.99	2.99	3.37
NO. OBS.	122.	86.	88.	87.	150.	145.	149.	140.	126.	132.	112.	86.	1427.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
W. OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. 2	0.00	5.00	0.00	0.00	0.00	13.79	6.90	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. 3	100.00	90.00	71.43	91.30	79.79	75.86	75.86	90.91	81.82	65.00	73.33	86.67	82.13
W. OCC. 4	0.00	5.00	28.57	8.70	12.12	10.34	17.24	9.99	13.64	20.00	20.00	10.00	12.37
W. OCC. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	27.	80.	21.	23.	33.	29.	29.	22.	22.	20.	15.	30.	291.
<b>COMPASS SECTOR</b>													
W. OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W. OCC. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	92.	85.	67.	84.	118.	114.	121.	115.	104.	110.	96.	56.	1124.
<b>BREAKER TYPE</b>													
SOCC SPILL	83.47	86.21	85.91	83.72	91.50	93.06	90.67	86.33	84.82	88.28	88.39	85.88	86.46
SP/L	16.53	11.49	16.09	16.28	5.23	5.56	6.00	5.76	9.52	10.16	10.71	21.18	10.30
PLUNGE	0.00	1.15	0.00	0.00	1.96	.89	0.00	0.00	.79	0.00	0.00	12.94	1.20
BURGE	0.00	1.15	0.00	0.00	1.31	.69	3.33	7.91	6.76	1.36	.89	0.00	2.03
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	121.	87.	87.	86.	153.	144.	150.	139.	126.	126.	112.	85.	1416.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	-0.04	-0.35	-0.48	-0.33	-0.32	-0.41	-0.30	-0.01	-0.08	-0.29	-0.24	-0.07	-0.23
GROSS MEAN	.82	.90	.81	.73	.56	.63	.55	.47	.48	.45	.50	.51	.61
STD DEV	.74	.76	.74	.67	.41	.44	.44	.51	.46	.52	.37	.51	.53
NO. OBS.	63.	45.	87.	46.	77.	73.	78.	71.	58.	48.	56.	43.	704.
<b>FORESHORE SLOPE</b>													
MEAN (OBS)	6.09	4.93	5.16	5.91	5.60	5.39	5.03	4.84	5.10	5.08	5.96	6.30	5.41
STD DEV	3.00	1.45	1.84	2.18	1.49	1.52	1.48	1.24	1.35	1.32	1.88	1.79	1.79
NO. OBS.	55.	44.	60.	45.	75.	72.	75.	70.	50.	62.	55.	44.	700.
<b>RIPS</b>													
W. OCC	37.10	39.53	42.05	40.91	37.01	26.21	6.00	3.37	12.60	24.81	30.36	43.02	26.66
MEAN SPAC.	367.46	250.44	308.65	357.92	447.46	465.66	502.76	535.00	400.00	471.09	408.24	369.59	420.98
NO. OBS.	124.	86.	88.	88.	134.	145.	150.	140.	137.	129.	112.	86.	1429.
<b>CURB &amp; OCC.</b>													
MEAN SPAC.	29.84	39.08	43.18	42.05	42.86	39.04	26.67	20.71	23.62	22.73	30.36	46.51	32.91
NO. OBS.	108.64	102.94	107.76	125.78	68.59	109.46	106.83	89.00	101.27	99.83	79.85	91.00	101.44
NO. OBS.	124.	87.	88.	86.	154.	144.	150.	140.	127.	132.	112.	86.	1434.

5022 STINSON BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 5- 1-68 AND ENDING 12-31-68.

SURF HRS.	JAN	FEB	MARCH	APRIL	MAY	JUN	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MRS.
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	3.64	3.82	3.19	3.41	3.53	3.55	3.92	1.83	3.60
STD DEV	0.00	0.00	0.00	0.00	.82	.97	.62	1.09	1.03	1.45	.98	1.33	1.08
NO. MRS.	0.	0.	0.	0.	61.	60.	62.	61.	58.	60.	51.	50.	467.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	12.29	11.62	12.74	13.27	12.62	12.02	12.82	11.72	12.39
STD DEV	0.00	0.00	0.00	0.00	2.04	2.08	2.76	2.09	2.43	2.83	1.46	2.35	2.38
NO. MRS.	0.	0.	0.	0.	61.	59.	61.	61.	57.	60.	51.	54.	464.
DIRECTION													
COMPASS SPECTUM													
DEC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DEC. NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	1.72	0.00	1.47	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	3.23	6.67	5.26	25.86	13.73	51.85	12.88
SW	0.00	0.00	0.00	0.00	74.14	93.10	96.77	90.00	89.47	65.52	78.43	48.15	79.91
W	0.00	0.00	0.00	0.00	25.86	5.17	0.00	0.00	3.51	6.90	7.84	0.00	6.11
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	0.00	0.00	0.00	0.00	.22
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	1.72	0.00	0.00	.44
NO. MRS.	0.	0.	0.	0.	58.	56.	62.	60.	57.	58.	51.	54.	458.
BREAKER TYPE													
TRCC SPILL	0.00	0.00	0.00	0.00	93.33	98.28	91.94	81.97	89.66	96.55	98.04	86.79	91.97
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	13.21	1.95
SURGE	0.00	0.00	0.00	0.00	3.33	1.72	8.06	18.03	10.34	3.45	1.96	0.00	6.07
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. MRS.	0.	0.	0.	0.	60.	58.	62.	61.	58.	58.	51.	53.	461.
CURRENT MRS.													
(FT/SEC)													
NFT MEAN	0.00	0.00	0.00	0.00	-0.09	-0.13	-0.22	.31	.22	-0.07	-0.26	.12	-0.01
GROSS MEAN	0.00	0.00	0.00	0.00	.53	.58	.71	.57	.41	.39	.42	.55	.56
STD DEV	0.00	0.00	0.00	0.00	.47	.36	.61	.73	.54	.33	.38	.52	.50
NO. MRS.	0.	0.	0.	0.	30.	30.	31.	31.	24.	13.	25.	25.	209.
FORESHORE SLOPE													
MEAN (NEG)	0.00	0.00	0.00	0.00	6.17	5.79	5.23	4.70	5.54	5.89	7.56	7.38	5.98
STD DEV	0.00	0.00	0.00	0.00	1.37	1.54	.92	1.24	1.33	1.19	1.32	1.06	1.54
NO. MRS.	0.	0.	0.	0.	30.	29.	31.	30.	26.	27.	24.	26.	223.
RIPS & DEC													
MEAN SPAC.	0.00	0.00	0.00	0.00	16.07	22.03	3.23	0.00	15.52	36.67	56.86	48.15	26.39
NO. MRS.	0.	0.	0.	0.	61.	59.	62.	61.	58.	60.	51.	54.	318.82
CURBS & DEC.													
MEAN SPAC.	0.00	0.00	0.00	0.00	44.26	40.00	46.77	34.43	36.21	16.67	52.84	46.30	39.40
NO. MRS.	0.	0.	0.	0.	76.67	134.17	98.10	101.71	110.00	129.50	78.70	90.60	102.93
NO. MRS.	0.	0.	0.	0.	61.	60.	62.	61.	58.	60.	51.	54.	467.

# 5022 STINSON BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 1-69 AND ENDING 12- 1-69.

SUN# OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	1.52	4.50	3.03	4.01	3.90	3.27	3.37	3.57	3.74	3.33	3.62	4.50	3.76
STD DEV	1.40	1.26	1.10	2.03	1.17	.78	1.10	1.11	1.00	1.08	1.19	.71	1.34
NO. OBS.	41.	54.	59.	57.	60.	55.	59.	56.	47.	52.	45.	2.	611.
PERIOD (SEC)													
MEAN	12.68	14.36	16.54	14.72	13.67	11.58	10.51	10.02	10.73	11.46	11.14	11.75	12.57
STD DEV	3.62	2.98	3.14	1.26	3.15	2.40	2.12	2.32	2.26	2.38	1.67	1.06	3.39
NO. OBS.	62.	55.	59.	57.	60.	56.	59.	56.	47.	52.	45.	2.	610.
DIRECTION													
COMPASS SECTION													
0 DEC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	9.64	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	41.94	45.45	16.95	47.86	26.67	0.00	0.00	5.45	38.30	11.54	0.00	0.00	1.15
SW	51.94	52.73	43.05	30.36	51.67	40.71	89.83	92.73	59.37	78.85	100.00	100.00	24.51
W	0.00	0.00	0.00	1.79	16.67	39.29	1.69	1.82	0.00	9.82	0.00	0.00	66.45
NW	1.61	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.58
CALM	4.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13	0.00	0.00	0.00	.66
NO. OBS.	62.	55.	59.	56.	60.	56.	59.	55.	47.	52.	45.	2.	608.
WRECKER TYPE													
WRECK SPILL	100.00	98.21	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.83
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SINGLE	0.00	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.17
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	61.	54.	59.	55.	60.	56.	59.	55.	46.	51.	45.	2.	605.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	.34	-.71	-.65	-.21	-.52	-.69	-.47	-.37	-.57	-.45	-.37	-.50	-.41
GROSS MEAN	1.06	1.24	1.04	.76	.61	.81	.49	.47	.65	.51	.43	.50	.75
STD DEV	.92	.70	.74	.88	.27	.51	.20	.24	.42	.33	.24	.00	.57
NO. OBS.	11.	24.	31.	34.	30.	28.	29.	28.	22.	26.	23.	1.	307.
FORESHORE SLOPE													
MEAN (DEC)	7.03	5.36	6.00	7.00	5.87	5.64	5.34	4.57	5.14	5.16	4.81	5.00	5.68
STD DEV	3.51	1.39	1.31	1.81	1.25	1.10	1.32	1.17	1.01	1.18	1.12	0.00	1.81
NO. OBS.	10.	24.	29.	29.	30.	28.	29.	28.	21.	25.	21.	1.	299.
RIPS & OCC	34.10	34.21	47.46	47.17	45.00	30.36	3.39	1.79	6.34	4.08	0.00	0.00	25.94
MEAN SPAC.	290.54	212.96	241.43	241.11	445.00	346.76	400.00	300.00	316.67	800.00	0.00	0.00	330.41
NO. OBS.	43.	54.	59.	57.	60.	56.	59.	56.	47.	44.	45.	2.	609.
CUSPS & OCC	30.14	41.07	47.44	50.88	48.33	42.86	5.08	1.79	8.51	25.00	0.00	0.00	28.27
MEAN SPAC.	43.16	40.35	99.46	117.59	124.28	92.71	43.31	75.00	90.75	92.31	0.00	0.00	40.11
NO. OBS.	43.	54.	59.	57.	60.	56.	59.	56.	47.	52.	45.	2.	612.

# SUMMARY FOR PERIOD STARTING 1-1-70 AND ENDING 12-31-70.

## CALIFORNIA

## 5022 STATION, BEACH

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	3.97	3.70	4.14	3.00	4.03	3.13	1.60	3.57	2.50	2.25	2.00	3.50	3.48
STD DEV	1.26	.95	.69	.76	.52	1.13	1.14	1.01	1.29	.50	2.07	1.68	1.35
NO. OBS.	33.	10.	7.	8.	8.	8.	5.	7.	4.	4.	5.	12.	111.
PERIOD (SEC)													
MEAN	11.68	10.94	10.66	10.35	10.06	11.68	9.94	10.61	12.28	17.20	13.08	13.31	11.64
STD DEV	2.56	1.58	1.61	1.47	1.31	2.23	1.95	3.41	5.59	8.91	1.99	2.60	3.07
NO. OBS.	33.	10.	8.	8.	9.	8.	5.	7.	4.	4.	5.	12.	113.
DIRECTION													
COASTAL SECTOR													
0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAL.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	5.	6.	4.	4.	5.	12.	53.
COMPASS SECTOR													
0 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAL.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	32.	10.	8.	8.	9.	8.	5.	6.	4.	4.	5.	12.	53.
BREAKER TYPE													
TOCC SPILL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	75.00	60.00	58.33	92.92
SPYPL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	40.00	33.33	6.19
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAL.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	33.	10.	8.	8.	9.	8.	5.	7.	4.	4.	5.	12.	113.
CURRENT OBS.													
(FT/SEC)													
MEAN	-0.50	.57	-0.24	-1.04	-1.17	-0.48	-0.44	-0.15	.29	-0.52	.25	-0.11	-0.33
STD DEV	.73	.70	.24	1.06	1.17	.98	.35	.20	.61	.52	.75	.40	.63
NO. OBS.	18.	5.	4.	4.	5.	4.	3.	4.	3.	1.	4.	8.	63.
FORESHORE SLOPE													
MEAN (OBS)	9.30	5.00	3.75	4.50	4.40	5.25	3.67	3.50	4.00	7.00	4.25	5.25	4.89
STD DEV	1.30	.71	2.63	.58	.55	1.50	.58	1.00	1.00	2.63	.96	1.04	1.51
NO. OBS.	10.	5.	4.	4.	5.	4.	3.	4.	3.	2.	4.	8.	56.
RIPS													
MEAN (OBS)	42.47	22.22	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.33	22.32
STD DEV	114.29	650.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	214.29	225.83
NO. OBS.	35.	6.	8.	8.	6.	8.	5.	7.	6.	4.	5.	12.	112.
CUSPS													
MEAN (OBS)	30.30	40.00	37.50	12.50	55.56	50.00	20.00	42.86	25.00	25.00	40.00	66.67	38.05
STD DEV	134.00	93.75	150.00	80.00	92.00	83.75	8.00	40.00	50.00	60.00	92.50	96.87	98.08
NO. OBS.	35.	10.	8.	8.	9.	8.	5.	7.	4.	4.	5.	12.	113.

5022 STINSON REACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 2-71 AND ENDING 12-25-71.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WEIGHT (FT)													
MEAN	3.33	3.50	4.00	3.17	3.00	2.88	2.75	0.00	0.00	3.75	4.63	3.88	3.51
STD DEV	1.56	.76	1.10	.98	1.07	1.13	.50	0.00	0.00	1.16	1.30	.99	1.21
NO. OBS.	12.	8.	6.	6.	8.	8.	8.	0.	0.	8.	8.	8.	76.
PERIOD (SEC)													
MEAN	14.26	14.80	15.33	15.50	13.56	12.19	13.63	0.00	0.00	12.74	13.86	14.29	13.98
STD DEV	2.71	2.27	2.98	1.55	4.48	3.70	2.53	0.00	0.00	1.06	1.45	1.75	2.82
NO. OBS.	12.	8.	6.	6.	8.	8.	4.	0.	0.	8.	8.	8.	76.
DIRECTION													
COASTAL SECTOR													
1 OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	85.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.11
3	100.00	87.50	100.00	100.00	75.00	85.71	100.00	0.00	0.00	87.50	71.43	62.50	86.30
4	0.00	12.50	0.00	0.00	0.00	14.29	0.00	0.00	0.00	12.50	24.57	25.00	9.59
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	11.	8.	6.	6.	8.	7.	4.	0.	0.	8.	7.	8.	73.
BREAKER TYPE													
30CC SPILL	33.33	12.50	16.67	16.67	87.50	75.00	50.00	0.00	0.00	37.50	12.50	0.00	34.21
SP/PL	66.67	87.50	83.33	83.33	0.00	25.00	50.00	0.00	0.00	62.50	87.50	100.00	64.47
PLUNGE	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	12.	8.	6.	6.	8.	8.	4.	0.	0.	8.	8.	8.	76.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-.34	-.22	-.15	-.35	.19	-.68	-.92	0.00	0.00	-.23	-.03	.03	-.24
GROSS MEAN	.39	.26	.37	.65	.36	.68	.92	0.00	0.00	.37	.04	.03	.39
STD DEV	.50	.30	.29	.74	.41	.73	1.30	0.00	0.00	.41	.08	.05	.40
NO. OBS.	6.	4.	3.	3.	4.	4.	2.	0.	0.	4.	4.	4.	38.
FURTHER SLOPE													
MEAN (DEC)	4.00	3.33	3.67	3.33	4.00	3.50	3.50	0.00	0.00	4.75	4.75	4.00	3.94
STD DEV	1.10	.58	.58	1.53	0.00	.58	.71	0.00	0.00	1.26	1.26	.62	1.00
NO. OBS.	6.	3.	3.	3.	2.	4.	2.	0.	0.	4.	4.	4.	35.
RIPS													
3 OCC	50.00	50.00	50.00	50.00	0.00	50.00	0.00	0.00	0.00	50.00	37.50	50.00	40.79
MEAN SPAC.	271.67	328.75	290.00	766.67	0.00	825.00	0.00	0.00	0.00	1125.00	1366.67	912.50	606.10
NO. OBS.	12.	8.	6.	6.	8.	8.	4.	0.	0.	8.	8.	8.	76.
CUSPS													
2 OCC	50.00	50.00	50.00	50.00	25.00	0.00	50.00	0.00	0.00	37.50	37.50	50.00	39.47
MEAN SPAC.	128.67	110.00	125.00	166.67	75.00	0.00	400.00	0.00	0.00	76.33	71.67	112.50	113.08
NO. OBS.	12.	8.	6.	6.	8.	8.	4.	0.	0.	8.	8.	8.	76.

2022 STATION REACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 1-72 AND ENDING 12-30-72.

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
WEIGHT (FT)													
MEAN	2.63	3.20	4.38	3.67	3.75	3.83	3.20	3.75	3.75	4.75	5.00	4.00	3.77
STD DEV	1.41	1.92	.92	1.00	.46	.41	.79	.89	.71	1.28	0.00	1.05	1.12
NO. OBS.	8.	5.	8.	9.	8.	6.	10.	8.	8.	8.	3.	10.	91.
PERIOD (SEC)													
MEAN	19.51	12.32	14.09	14.28	14.73	14.73	14.20	15.20	14.39	14.34	13.83	17.28	14.65
STD DEV	3.69	2.83	1.14	2.28	2.17	1.16	1.17	.83	.97	1.88	2.29	3.02	2.26
NO. OBS.	7.	5.	8.	9.	8.	6.	10.	8.	8.	8.	3.	10.	90.
DIRECTION													
COASTAL SECTOR													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	12.50	33.33	20.00	0.00	12.50	37.50	0.00	0.00	10.00
3	100.00	100.00	37.50	77.78	50.00	33.33	30.00	75.00	50.00	25.00	66.67	100.00	61.11
4	0.00	0.00	62.50	22.22	37.50	33.33	50.00	25.00	37.50	37.50	33.33	0.00	28.89
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	8.	8.	8.	9.	8.	6.	10.	8.	8.	8.	3.	10.	90.
WATER TYPE													
BOCC SPILL	28.57	60.00	0.00	11.11	0.00	0.00	30.00	12.50	0.00	0.00	0.00	10.00	12.50
SP/PL	71.43	20.00	100.00	88.89	100.00	100.00	70.00	87.50	100.00	100.00	100.00	60.00	82.95
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	4.55
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	7.	5.	7.	9.	8.	6.	10.	8.	8.	7.	3.	10.	88.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-.27	.42	-.14	-.16	-.03	-.13	.13	.03	.15	.18	-.03	.24	.04
GROSS MEAN	.39	.54	.14	.23	.10	.13	.14	.06	.13	.28	.03	.86	.28
STD DEV	.43	.87	.22	.26	.13	.24	.20	.07	.18	.36	.04	.76	.36
NO. OBS.	4.	4.	4.	5.	4.	3.	5.	4.	4.	4.	2.	5.	48.
FURROWS SLOPE													
MEAN (DEG)	3.60	3.50	2.00	3.40	2.75	2.33	2.20	2.75	3.00	4.75	4.50	4.40	3.27
STD DEV	1.52	1.91	1.00	1.34	.50	.58	1.30	.96	1.83	1.50	2.12	2.19	1.57
NO. OBS.	5.	4.	3.	5.	4.	3.	5.	4.	4.	4.	2.	5.	48.
RIPS & OCC	12.50	20.00	50.00	33.33	50.00	50.00	50.00	50.00	50.00	50.00	66.67	0.00	38.46
MEAN SPAC.	1000.00	150.00	747.50	825.00	713.75	533.33	545.00	593.75	447.50	306.25	600.00	0.00	547.42
NO. OBS.	8.	5.	8.	9.	8.	6.	10.	8.	8.	8.	3.	10.	91.
CUSPS & OCC.	25.00	60.00	50.00	44.44	37.50	50.00	50.00	50.00	50.00	37.50	66.67	30.00	43.96
MEAN SPAC.	167.50	171.67	121.25	151.00	74.33	105.00	74.00	62.50	78.75	68.33	95.00	50.00	98.39
NO. OBS.	8.	5.	8.	9.	8.	6.	10.	8.	8.	8.	3.	10.	91.

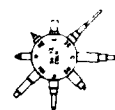
5022 STATION HEAD CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 8-73 AND ENDING 9-30-73.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WIND (FT)													
MEAN	3.63	5.00	5.57	3.50	3.38	2.63	2.10	1.75	2.60	0.00	0.00	0.00	3.13
STD DEV	1.06	1.07	.53	.76	1.06	.92	.95	.86	.63	0.00	0.00	0.00	1.20
NO. OBS.	8.	8.	7.	8.	8.	8.	10.	8.	10.	0.	0.	0.	75.
PERIOD (SEC)													
MEAN	16.48	24.26	21.10	20.44	18.23	18.49	15.70	15.25	13.07	0.00	0.00	0.00	17.84
STD DEV	5.76	4.68	5.95	5.83	4.83	2.49	3.39	1.60	2.54	0.00	0.00	0.00	5.22
NO. OBS.	8.	8.	7.	7.	8.	8.	10.	8.	10.	0.	0.	0.	74.
DIRECTION													
COASTAL SECTOR													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OCC. 2	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OCC. 3	0.00	87.50	85.71	100.00	87.50	100.00	100.00	100.00	100.00	0.00	0.00	0.00	1.33
OCC. 4	0.00	0.00	14.29	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	96.00
OCC. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	8.	8.	7.	8.	8.	8.	10.	8.	10.	0.	0.	0.	75.
WATER TYPE													
SOCC SPILL	12.50	75.00	71.43	87.50	100.00	87.50	100.00	87.50	50.00	0.00	0.00	0.00	74.67
SP/PL	87.50	25.00	24.57	12.50	0.00	0.00	0.00	12.50	40.00	0.00	0.00	0.00	22.67
PLUNGE	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	10.00	0.00	0.00	0.00	2.67
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	8.	8.	7.	8.	8.	8.	10.	8.	10.	0.	0.	0.	75.
CURRENT OBS.													
(FI/SEC)													
MEAN	-0.23	.03	-0.17	-0.73	-0.25	-0.15	.08	.25	.21	0.00	0.00	0.00	-0.10
GROSS MEAN	.48	.72	.41	.73	.25	.25	.30	.25	.24	0.00	0.00	0.00	.40
STD DEV	.59	.46	.30	.62	.38	.34	.29	.37	.21	0.00	0.00	0.00	.35
NO. OBS.	4.	4.	5.	4.	4.	4.	5.	4.	5.	0.	0.	0.	39.
FORESHORE SLOPE													
MEAN (NEG)	4.75	4.50	4.20	4.50	4.50	5.00	6.20	4.25	5.00	0.00	0.00	0.00	4.79
STD DEV	1.26	1.00	1.10	1.00	.58	1.41	2.17	.50	.71	0.00	0.00	0.00	1.24
NO. OBS.	4.	4.	5.	4.	4.	4.	5.	4.	5.	0.	0.	0.	39.
RIPS X OCC	12.50	0.00	0.00	37.50	50.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	12.00
MEAN SPAC.	1500.00	0.00	0.00	535.33	662.50	700.00	0.00	0.00	0.00	0.00	0.00	0.00	362.22
NO. OBS.	8.	8.	7.	8.	8.	8.	10.	8.	10.	0.	0.	0.	75.
CUSPS X OCC.	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	72.00	0.00	0.00	0.00	0.00	0.00	0.00	7.66
NO. OBS.	8.	8.	7.	8.	8.	8.	10.	8.	10.	0.	0.	0.	75.

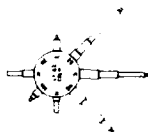


# WIND ROSES 05022 STINSON

1000 HOURS



JANUARY



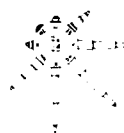
FEBRUARY



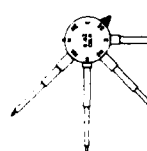
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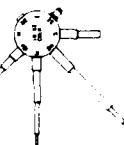
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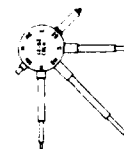
MAY



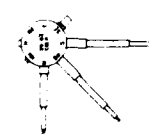
JUNE



JULY



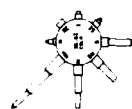
AUGUST



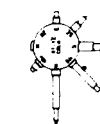
SEPTEMBER



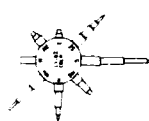
OCTOBER



NOVEMBER



DECEMBER



JANUARY

WIND ROSE DATA  
STATION 05022 STINSON

DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
1 JANUARY 1953 TO 31 DECEMBER 1953

SUMMARY FOR PERIOD STARTING 40 2-1-1 AND ENDING 7-25-70.

[illegible]

SOOP THOMSON, MACH. SUMMARY FOR PERIOD STARTING 4-2-68 AND ENDING 12-31-68.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MOS.
SUMP (HMS)													
MEAN	0.00	0.00	0.00	3.90	3.03	3.76	4.00	3.71	3.00	4.40	4.88	3.95	3.95
STD DEV	0.00	0.00	0.00	2.7	3.40	3.90	4.7	1.50	1.27	1.90	1.83	1.21	1.30
NO. OBS.	0.	0.	0.	50.	51.	59.	43.	24.	33.	39.	43.	43.	389.
PERIOD (HMS)													
MEAN	0.00	0.00	0.00	12.41	11.15	10.60	10.40	12.99	11.08	11.33	11.03	10.84	11.30
STD DEV	0.00	0.00	0.00	3.14	3.19	3.02	2.82	3.55	2.03	2.54	3.46	2.02	2.99
NO. OBS.	0.	0.	0.	56.	50.	53.	38.	17.	31.	39.	43.	42.	369.
ORIENTATION													
COMPASS SECTION													
NO. OBS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	0.00	0.00	0.00	27
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	0.00	0.00	0.00	12.73	8.16	8.00	0.00	36.36	16.13	12.50	0.00	12.50	9.36
STD DEV	0.00	0.00	0.00	76.36	91.84	94.44	100.00	50.00	54.84	80.00	90.24	82.50	82.69
NO. OBS.	0.00	0.00	0.00	10.91	0.00	3.70	0.00	13.64	19.35	2.50	2.44	5.00	5.61
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.45	0.00	4.88	0.00	1.07
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.	40.	41.	40.	374.
NO. OBS.	0.	0.	0.	55.	49.	54.	42.	22.	31.	40.	41.	40.	374.
MEAN TYPE													
MEAN TYPE	0.00	0.00	0.00	14.55	0.00	0.00	6.82	4.00	55.88	65.00	30.95	0.00	16.04
STD DEV	0.00	0.00	0.00	81.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.00	0.00	0.00	74.00	0.00	0.00	84.09	92.00	44.12	35.00	69.05	100.00	72.68
MEAN	0.00	0.00	0.00	26.00	0.00	0.00	9.09	4.00	0.00	0.00	0.00	0.00	4.28
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	55.	50.	58.	44.	25.	34.	40.	42.	40.	388.
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	29.	27.	31.	25.	9.	22.	23.	18.	20.	204.
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	27.	26.	27.	21.	22.	25.	29.	21.	26.	224.
MEAN	0.00	0.00	0.00	2.37	2.81	3.49	4.29	6.55	9.52	8.24	4.90	5.23	5.32
STD DEV	0.00	0.00	0.00	1.01	1.36	1.50	1.79	2.81	4.74	2.82	1.44	3.22	3.41
NO. OBS.	0.	0.	0.	27.	26.	27.	21.	22.	25.	29.	21.	26.	224.
MEAN	0.00	0.00	0.00	1.79	0.00	0.00	4.44	20.00	44.12	32.50	6.98	4.65	10.35
STD DEV	0.00	0.00	0.00	30.00	0.00	0.00	137.50	88.60	68.80	101.34	143.33	350.00	95.19
NO. OBS.	0.	0.	0.	56.	51.	59.	45.	25.	34.	40.	43.	43.	396.
MEAN	0.00	0.00	0.00	0.00	1.46	0.00	2.22	20.00	2.94	10.00	9.30	11.95	5.56
STD DEV	0.00	0.00	0.00	0.00	16.00	0.00	20.00	9.20	20.00	80.50	300.00	250.17	74.94
NO. OBS.	0.	0.	0.	56.	51.	59.	45.	25.	34.	40.	43.	43.	396.

# 5002 THORNTON BEACH CALIFORNIA

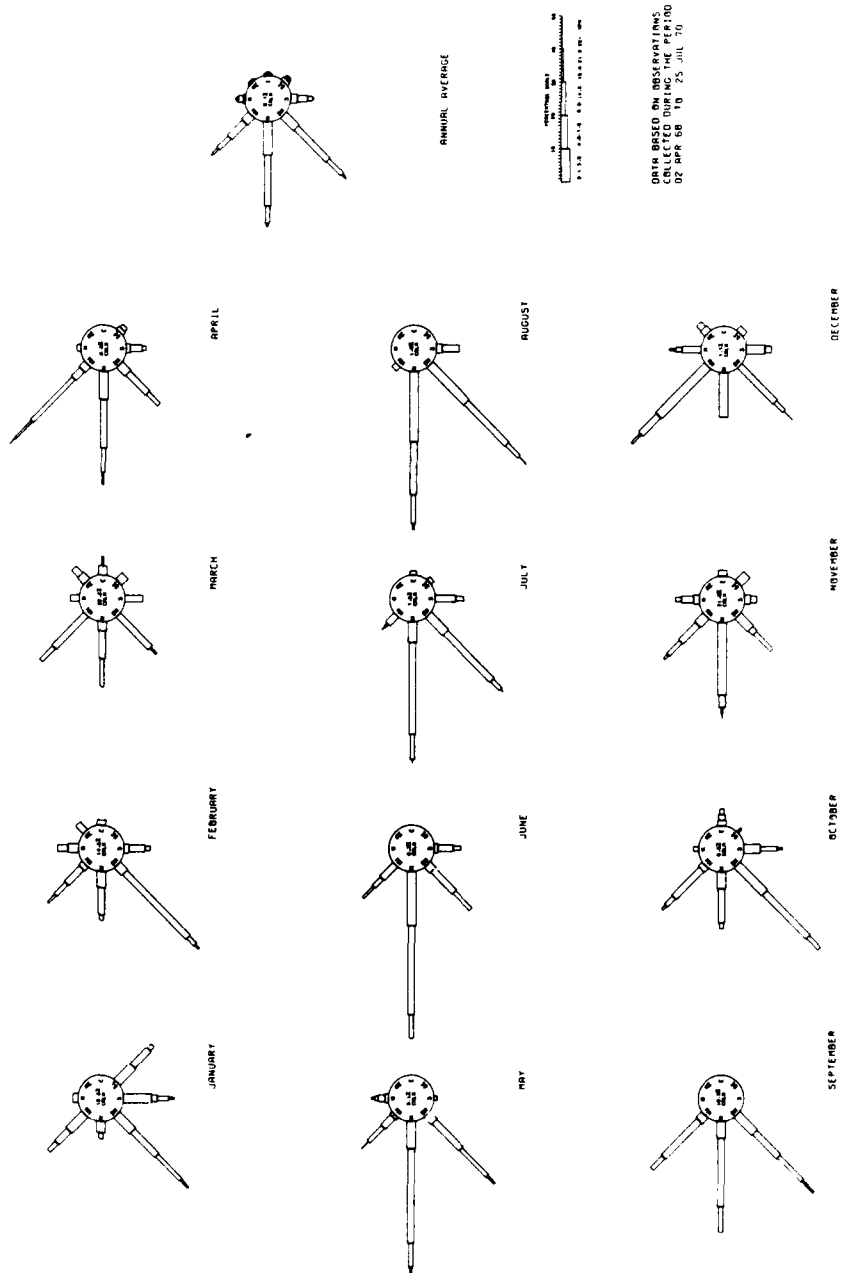
SUMMARY FOR PERIOD STARTING 1-1-69 AND ENDING 12-25-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	4.29	6.45	5.38	5.16	3.94	3.10	2.69	2.91	4.00	4.92	4.07	6.90	4.40
STD DEV	1.40	3.49	3.49	1.36	1.11	.88	1.07	1.31	1.63	1.20	1.69	2.02	2.33
NO. OBS.	49.	42.	32.	19.	32.	30.	29.	33.	19.	26.	14.	10.	335.
PERIOD (SEC)													
MEAN	10.45	10.48	10.16	9.47	10.07	10.24	9.54	9.55	14.90	12.28	11.46	11.83	10.73
STD DEV	1.73	2.29	3.93	2.19	3.34	2.62	2.73	2.48	4.71	1.71	2.30	4.56	3.09
NO. OBS.	49.	42.	32.	19.	31.	30.	29.	33.	20.	26.	14.	10.	334.
DIRECTION													
COMPASS SECTOR													
NCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	2.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	26.09	40.48	7.14	0.00	35.48	16.00	7.14	0.00	0.00	4.00	0.00	0.00	.62
W	71.74	59.52	67.86	27.78	32.26	86.67	85.71	96.97	75.00	12.00	0.00	48.44	17.08
NW	0.00	0.00	25.00	72.22	32.26	3.33	7.14	3.03	20.00	72.00	58.33	55.56	68.01
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	46.	42.	28.	14.	31.	30.	28.	33.	20.	25.	12.	9.	322.
BREAKER TYPE													
XOCC SPILL	0.00	14.63	50.00	5.56	3.23	36.67	68.97	54.55	60.00	11.54	38.46	11.11	26.13
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	100.00	85.37	50.00	94.44	98.77	63.33	31.03	45.45	40.00	88.46	61.54	88.69	71.87
SUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	49.	41.	28.	18.	31.	30.	29.	31.	20.	26.	13.	9.	327.
CURRENT OBS.													
(F1/SEC)													
NET MEAN	.01	.21	-.52	-.49	-.55	-.48	-.44	-.01	-.40	-1.31	0.00	0.00	-.32
GROSS MEAN	1.11	1.18	.81	.86	.56	.72	.77	.51	1.08	1.31	0.00	0.00	.87
STD DEV	.67	.75	.62	.72	.44	.68	.51	.51	.87	.95	0.00	0.00	.85
NO. OBS.	27.	23.	24.	16.	20.	16.	21.	19.	13.	6.	0.	0.	185.
FORESHORE SLOPE													
MEAN (DEG)	5.25	3.48	4.86	0.00	4.43	3.62	3.93	4.23	2.70	3.00	3.67	2.50	3.67
STD DEV	1.24	.78	1.57	0.00	2.57	1.90	1.51	2.10	.94	1.73	.98	.71	1.82
NO. OBS.	24.	13.	7.	0.	7.	21.	28.	26.	10.	11.	3.	2.	156.
RIPS & OCC													
MEAN SPAC.	2.04	0.00	6.98	0.00	46.88	33.33	65.82	48.48	10.00	0.00	0.00	0.00	19.58
NO. OBS.	300.00	0.00	325.00	0.00	453.33	168.00	39.42	121.88	175.00	0.00	0.00	0.00	157.84
CUSPS & OCC													
MEAN SPAC.	14.58	0.00	3.13	0.00	0.00	23.33	48.28	51.52	5.00	0.00	0.00	0.00	14.03
NO. OBS.	107.14	0.00	140.00	0.00	0.00	89.43	67.43	79.41	180.00	0.00	0.00	0.00	63.05
	48.	42.	32.	19.	32.	30.	29.	33.	20.	26.	14.	10.	335.

5002 THORNTON BEACH										SUMMARY FOR PERIOD STARTING 1- 9-70 AND ENDING 7-25-70.									
CALIFORNIA																			
SURF OBS.																			
WGT (G)	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.						
WGT (G)	5.00	4.30	3.50	4.50	4.53	0.00	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	2.45	1.12	1.29	1.27	1.18	0.00	.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	13.	21.	4.	10.	17.	0.	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PERIOD (SEC)																			
WGT (G)	11.12	12.40	11.01	11.90	10.47	0.00	8.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	1.54	1.62	2.27	.32	2.32	0.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	13.	21.	4.	10.	17.	0.	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DIRECTION																			
COASTAL SECTOR																			
WGT (G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CO-PASS SECTOR																			
WGT (G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
BREAKER TYPE																			
WGT (G)	15.34	15.00	50.00	10.00	31.25	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	13.	20.	4.	10.	16.	0.	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CURRENT OBS.																			
WGT (G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
FURROWS SLOPE																			
WGT (G)	1.00	1.00	0.00	2.00	2.23	0.00	13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	4.	4.	0.	0.	13.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RIPS																			
WGT (G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	13.	21.	4.	10.	15.	0.	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CUSPS																			
WGT (G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	13.	21.	4.	10.	17.	0.	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

# CALIFORNIA

## WIND ROSES 05002 THORNTON



SONS FRANCIS BEACH  
CALIFORNIA  
SUMMARY FOR PERIOD STARTING 4-3-68 AND ENDING 9-14-70.

SUMP NOS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL ORGS.
HEIGHT (FT)													
MEAN	4.79	6.43	5.25	4.86	3.55	4.19	4.00	3.25	4.69	5.33	5.11	4.65	4.57
STD DEV	1.08	2.36	1.34	1.61	1.25	1.19	1.19	1.25	1.30	2.24	1.45	1.96	1.92
NO. OBS.	88.	82.	88.	76.	80.	36.	62.	83.	35.	55.	36.	40.	623.
PERIOD (SEC)													
MEAN	10.11	10.32	13.45	11.01	12.75	13.35	11.84	11.78	13.44	10.64	10.81	9.66	11.61
STD DEV	2.82	2.58	2.64	2.31	2.66	2.44	2.33	3.46	4.45	3.00	2.27	3.51	3.13
NO. OBS.	48.	42.	47.	76.	61.	34.	60.	79.	34.	55.	34.	45.	619.
DIRECTION													
COASTAL SECTOR													
W. OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAL.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	9.	0.	0.	1.	7.	0.	22.	48.	2.	0.	0.	0.	80.
COMPASS SECTOR													
W. OCC. 1	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAL.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	48.	40.	46.	73.	53.	34.	40.	33.	33.	53.	34.	45.	534.
AREAKER TYPE													
ROCC SPILL	75.00	66.67	36.96	65.75	45.45	59.02	59.02	13.41	48.87	45.45	50.00	65.91	50.73
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SINGE	25.00	33.33	63.04	24.03	33.33	29.51	29.51	63.41	5.71	0.00	0.00	0.00	11.95
CAL.	0.00	0.00	0.00	0.22	10.00	8.20	8.20	19.51	36.49	50.55	50.00	34.09	33.28
NO. OBS.	88.	42.	46.	73.	60.	37.	61.	82.	35.	55.	36.	44.	619.
CURRENT OBS.													
(FT/SEC)													
MEAN	-0.37	-0.07	-0.75	-0.90	-0.50	-0.16	-0.34	0.09	-0.61	0.04	-0.41	0.26	-0.33
GROSS MEAN	1.09	1.04	0.94	1.06	0.82	0.84	0.84	0.51	0.75	0.89	1.20	1.96	0.96
STD DEV	0.98	1.20	0.66	0.85	0.49	0.43	0.44	0.48	0.67	0.51	1.26	1.89	0.92
NO. OBS.	26.	22.	27.	40.	34.	22.	43.	41.	24.	32.	20.	23.	356.
FORFATHRE SLOPE													
MEAN (DEC)	6.87	6.17	7.30	11.69	7.68	10.90	11.15	9.65	11.07	9.06	7.29	6.74	9.06
STD DEV	2.37	2.57	3.59	3.16	3.06	3.04	2.71	2.92	3.62	3.26	2.47	2.21	3.36
NO. OBS.	16.	16.	23.	32.	32.	21.	27.	40.	27.	32.	17.	19.	306.
RIPS													
W. OCC 1	40.94	52.27	56.17	32.44	15.69	47.37	75.41	77.65	40.00	34.18	38.69	51.11	49.05
MEAN SPAC.	247.50	231.78	234.62	281.00	247.44	324.15	429.70	429.70	207.43	210.47	262.46	334.04	245.03
NO. OBS.	48.	44.	44.	74.	44.	34.	62.	65.	45.	53.	36.	65.	634.
CUSPS													
W. OCC 1	2.04	0.00	2.08	22.37	8.22	39.47	3.44	3.44	34.29	9.09	2.78	2.22	11.51
MEAN SPAC.	70.00	0.00	160.00	145.71	37.22	16.67	173.33	173.33	11.83	94.80	875.00	160.00	49.71
NO. OBS.	48.	44.	44.	76.	61.	36.	61.	86.	35.	55.	36.	45.	634.



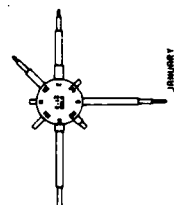




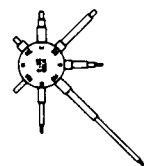


# CALIFORNIA

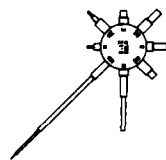
## WIND ROSES 05003 FRANCIS



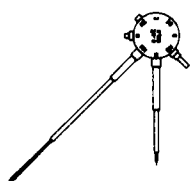
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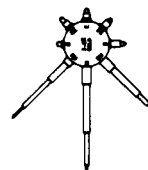
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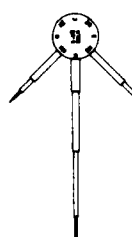
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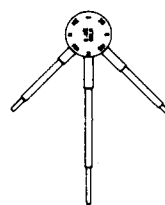
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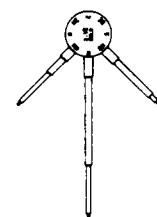
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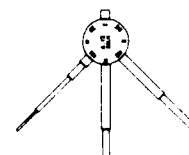
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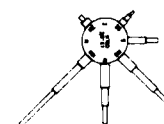
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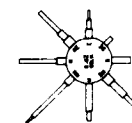
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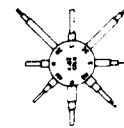
SEPTEMBER



OCTOBER



NOVEMBER



DECEMBER

ANNUAL AVERAGE



DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
03 APR 68 TO 14 SEP 70

# SUMMARY FOR PERIOD STARTING 6-3-68 AND ENDING 11-26-70.

## CALIFORNIA

## Some Natural Shields

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)													
MEAN	2.09	2.80	3.18	3.14	2.88	2.68	2.89	2.98	2.86	3.01	2.93	3.33	2.96
STD DEV	1.60	1.27	1.56	2.93	2.39	2.16	1.66	1.03	1.23	1.24	1.38	1.05	1.76
NO. OBS.	121.	98.	118.	156.	178.	171.	178.	176.	171.	178.	117.	112.	1703.
<b>PERIOD (SEC)</b>													
MEAN	10.68	11.74	13.92	13.71	13.43	14.27	14.13	14.27	13.51	13.47	14.10	11.65	13.30
STD DEV	2.08	1.99	4.45	3.65	2.62	4.28	3.99	4.17	2.94	3.42	3.82	3.07	3.66
NO. OBS.	121.	98.	113.	180.	173.	169.	179.	176.	173.	178.	126.	112.	1776.
<b>DIRECTION</b>													
COASTAL SECTOR													
OCC. 1	0.00	0.00	0.00	11.54	0.00	0.00	0.00	0.00	1.75	1.72	5.88	0.00	1.58
2	0.00	0.00	0.00	26.92	26.00	21.67	27.82	21.67	19.30	25.86	58.82	0.00	25.38
3	0.00	0.00	0.00	53.85	74.00	71.67	70.97	78.33	78.95	72.41	35.24	0.00	71.28
4	0.00	0.00	0.00	7.69	0.00	6.67	1.81	0.00	0.00	0.00	0.00	0.00	1.79
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	88.	50.	80.	82.	80.	57.	58.	17.	0.	390.
<b>COMPASS SECTOR</b>													
OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	17.81	29.73	28.07	28.97	38.32	16.36	9.17	17.82	0.00	15.73
S	100.00	93.62	77.68	76.67	66.67	66.44	65.42	58.88	82.73	90.00	81.19	95.50	79.83
SW	0.00	3.19	16.07	4.48	1.80	6.88	3.74	0.00	0.91	0.00	0.99	1.80	3.31
W	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	1.80	0.23
CALM	0.00	0.00	0.00	0.00	1.80	0.00	0.00	2.80	0.00	0.83	0.00	0.00	0.83
NO. OBS.	114.	98.	112.	134.	111.	108.	107.	107.	110.	120.	101.	111.	1329.
<b>BREAKER TYPE</b>													
TOCC SPILL	76.67	76.13	85.22	73.17	71.51	80.12	82.08	73.99	66.86	82.92	66.39	70.18	73.60
SP/PL	0.00	0.00	0.00	1.22	0.00	0.60	8.42	9.63	8.72	4.49	4.92	0.00	3.23
PLUNGE	16.67	21.08	18.78	15.85	19.19	13.25	11.56	15.61	23.84	12.58	27.05	18.42	19.21
SURGE	0.67	0.00	0.00	9.76	9.30	6.82	1.73	0.58	0.58	0.00	1.64	11.40	3.97
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	120.	98.	115.	184.	172.	166.	173.	173.	172.	178.	122.	116.	1785.
<b>CURRENT OBS.</b>													
(FI/SEC)													
NET MEAN	-0.11	-0.17	-0.08	-0.11	-0.02	-0.05	-0.01	-0.05	-0.05	-0.01	-0.02	-0.03	-0.04
<b>GROSS MEAN</b>													
STD DEV	0.23	0.22	0.21	0.22	0.16	0.14	0.16	0.15	0.13	0.18	0.17	0.23	0.17
NO. OBS.	61.	61.	52.	78.	87.	85.	87.	86.	86.	86.	80.	56.	886.
<b>FORESHORE SLOPE</b>													
MEAN (HFC)	3.38	2.30	3.25	1.75	2.20	2.58	2.55	2.60	3.52	2.54	2.74	2.51	2.65
STD DEV	1.04	1.07	2.20	0.77	1.29	1.02	1.19	1.46	1.72	1.12	1.16	1.26	1.39
NO. OBS.	61.	46.	55.	76.	84.	85.	83.	87.	85.	89.	82.	59.	872.
<b>RIPS &amp; OCC</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	121.	97.	115.	184.	174.	171.	179.	177.	173.	180.	171.	117.	1792.
<b>CUSPS &amp; OCC.</b>													
MEAN SPAC.	0.00	0.00	0.00	10.91	5.75	5.8	2.23	12.43	4.42	12.78	8.94	4.27	5.69
NO. OBS.	121.	97.	115.	184.	174.	171.	179.	177.	173.	180.	171.	117.	1792.

# SUMMARY FOR PERIOD STARTING 4- 3-68 AND ENDING 12-31-68.

## CALIFORNIA

## SAND NATURAL HWDRES

JAN FEB MARCH APRIL MAY JUNE JULY AUG SEPT OCT NOV DEC ALL OBS.

### SURF OBS.

HEIGHT (FT)

MEAN

STD DEV

NO. OBS.

PERIOD (SEC)

MEAN

STD DEV

NO. OBS.

DIRECTION

COMPASS SECTION

D UCC. N

E

S

SW

W

NW

CALM

NO. OBS.

MEANER TYPE

INCC SPILL

SP/PI

PLUNGE

SURGE

CALM

NO. OBS.

CURRENT OBS.

(FT/SEC)

NET MEAN

GROSS MEAN

STD DEV

NO. OBS.

FORESHORE SLOPE

MEAN (NEG)

STD DEV

NO. OBS.

WIPS

MEAN SPAC.

NO. OBS.

CUSPS

MEAN SPAC.

NO. OBS.

# SUMMARY FOR PERIOD STARTING 1-1-69 AND ENDING 12-31-69.

## CALIFORNIA

## 5000 NATURAL RANGES

SUMF. HRS. HEIGHT (FT) JAN FEB MARCH APRIL MAY JUNE JULY AUG SEPT OCT NOV DEC ALL HRS.

MEAN 2.90 3.53 3.96 4.69 3.51 3.10 3.13 2.00 3.36 2.87 2.78 3.31  
STD DEV 1.59 1.24 1.92 4.19 1.42 1.08 1.61 1.17 1.33 .96 1.36 1.86  
NO. HRS. 62. 45. 61. 54. 59. 60. 62. 62. 58. 60. 55. 60.

PERIOD (SEC) MEAN 9.46 10.92 15.44 16.25 14.33 17.11 16.31 14.70 14.95 14.20 14.88 13.13 14.57  
STD DEV 1.90 2.10 5.46 4.16 2.01 4.93 4.61 5.07 3.84 4.18 4.75 2.67 4.60  
NO. HRS. 62. 44. 61. 52. 59. 60. 62. 61. 58. 59. 56. 58. 692.

DIRECTION COMPASS SECTOR  
D. OCC. N 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00  
NE 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00  
E 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00  
SE 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00  
S 100.00 6.82 5.00 44.44 60.00 44.83 50.00 67.21 32.73 18.33 32.73 0.00 0.00  
SW 86.36 58.33 51.85 36.36 36.36 46.28 40.00 32.79 65.45 61.67 65.45 96.36 62.80  
W 0.00 6.82 30.00 1.85 0.00 6.80 6.87 0.00 1.82 0.00 1.82 0.00 4.76  
NW 0.00 0.00 0.00 0.00 0.00 0.00 1.67 0.00 0.00 0.00 0.00 0.00 1.15  
N 0.00 0.00 0.00 0.00 0.00 0.00 1.67 0.00 0.00 0.00 0.00 0.00 3.64  
CALM 0.00 0.00 6.67 1.85 3.64 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1.04  
NO. HRS. 55. 44. 60. 54. 55. 58. 60. 61. 55. 60. 55. 55. 672.

BREAKER TYPE  
KNCC SPILL 70.49 51.33 80.33 94.55 79.66 95.00 93.33 96.77 74.14 77.97 91.07 77.97 82.59  
SP/PL 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00  
PLUNGE 22.95 46.67 19.67 5.45 20.34 5.00 6.67 3.23 25.86 22.03 5.36 6.78 15.25  
SURGE 6.56 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 3.57 15.25 2.16  
CALM 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00  
NO. HRS. 61. 45. 61. 55. 59. 60. 60. 62. 58. 59. 56. 59. 695.

CURRENT HRS. (FT/SEC)  
NET MEAN -0.27 -0.12 -0.07 -0.29 -0.02 -0.05 -0.05 -0.04 -0.09 -0.04 -0.02 -0.03 -0.09  
GROSS MEAN 0.28 0.31 0.31 0.29 0.15 0.22 0.21 0.21 0.20 0.26 0.17 0.19 0.23  
STD DEV 0.25 0.14 0.14 0.19 0.13 0.27 0.27 0.29 0.35 0.29 0.20 0.20 0.23  
NO. HRS. 31. 22. 26. 25. 30. 30. 31. 31. 29. 31. 29. 30. 344.

FRESHWATER SLOPE  
MEAN (DEC) 3.58 1.77 2.23 2.46 2.97 3.76 3.38 3.03 3.83 3.03 3.60 2.80 3.07  
STD DEV 0.99 1.02 1.70 0.72 1.88 0.58 0.98 1.22 0.76 1.50 1.13 1.30 1.34  
NO. HRS. 11. 22. 30. 24. 29. 29. 29. 30. 29. 30. 30. 30. 343.

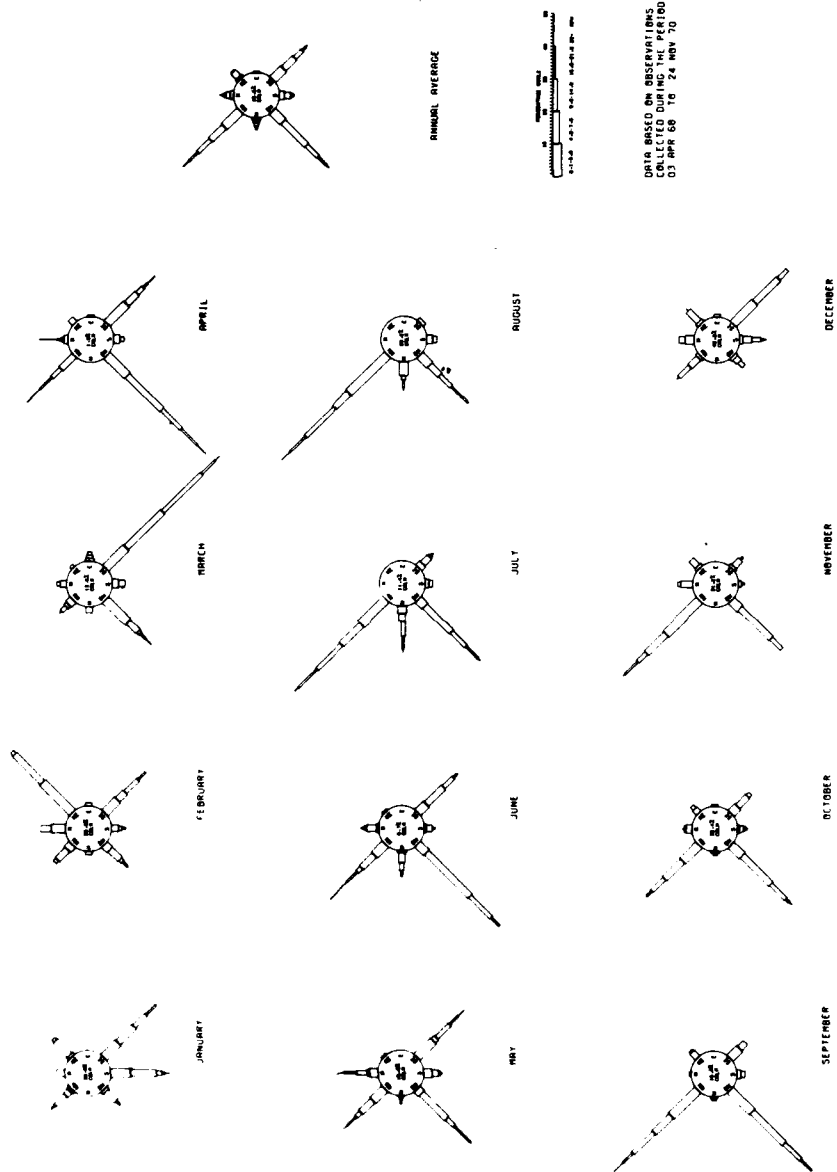
RIPS & OCC  
MEAN SPAC. 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00  
NO. HRS. 62. 45. 61. 55. 59. 60. 62. 62. 58. 60. 57. 60. 701.

CUSPS & OCC.  
MEAN SPAC. 0.00 0.00 0.00 3.44 0.00 0.00 1.61 35.48 1.72 5.00 1.75 3.33 4.56  
NO. HRS. 62. 45. 61. 55. 59. 60. 62. 62. 58. 60. 57. 60. 701.

SUMMARY FOR PERIOD STARTING 1-1-70 AND ENDING 11-20-70.											
CALIFORNIA											
5008 NATURAL BRIDGES											
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
SURF OBS.											
WEIGHT (FT)											
MEAN	3.08	2.12	2.06	1.94	2.75	2.68	3.10	2.92	3.14	3.25	2.47
STD DEV	1.42	.88	.74	1.01	3.77	3.34	2.07	.93	.97	1.30	1.01
NO. OBS.	50.	40.	53.	51.	56.	60.	62.	62.	58.	57.	17.
PERIOD (SEC)											
MEAN	11.45	12.44	12.10	11.93	12.63	11.60	11.63	12.04	12.41	12.42	13.94
STD DEV	1.86	1.35	1.41	2.78	3.19	1.56	1.63	1.89	2.39	2.33	3.95
NO. OBS.	50.	52.	52.	55.	55.	58.	62.	62.	58.	59.	17.
DIRECTION											
COASTAL SECTOR											
W. OCC.	1	0.00	0.00	11.54	0.00	0.00	0.00	0.00	1.75	1.72	5.88
2	0.00	0.00	0.00	26.92	26.00	21.67	27.42	21.67	19.30	25.86	58.82
3	0.00	0.00	0.00	53.85	74.00	71.87	70.97	78.33	78.95	72.41	35.29
4	0.00	0.00	0.00	7.69	0.00	6.67	1.61	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	26.	50.	80.	82.	60.	57.	58.	17.
COMPASS SECTOR											
W. OCC.	N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	100.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	50.	50.	52.	29.	0.	0.	0.	0.	0.	0.	0.
BREAKER TYPE											
W. OCC.	SPILL	100.00	90.74	85.71	100.00	94.64	86.89	83.33	85.61	92.63	58.82
SP/PL	0.00	0.00	0.00	3.57	0.00	1.79	13.11	28.33	28.32	14.04	35.29
PLUNGE	10.17	0.00	9.26	10.71	0.00	3.37	0.00	8.33	28.07	33.33	5.88
BURGE	6.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	50.	51.	54.	56.	54.	56.	61.	60.	57.	57.	17.
CURRENT OBS.											
(FT/SEC)											
NET MEAN	0.06	0.04	0.01	0.02	0.03	0.02	0.00	0.10	0.07	0.03	0.01
GROSS MEAN	.19	.11	.11	.08	.04	.04	.04	.10	.08	.04	.01
STD DEV	.17	.16	.13	.08	.07	.06	.07	.14	.11	.09	.02
NO. OBS.	30.	26.	26.	26.	27.	30.	31.	32.	29.	28.	7.
FORESHORE SLOPE											
MEAN (DEG)	3.17	2.79	4.44	1.22	1.63	1.93	1.45	1.14	2.14	1.97	1.88
STD DEV	1.05	.88	2.14	.92	.49	.37	.49	.37	.52	.19	.35
NO. OBS.	30.	24.	25.	27.	27.	30.	31.	32.	28.	29.	8.
RIPS & OCC											
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	50.	52.	54.	57.	56.	60.	62.	62.	58.	58.	17.
CUSPS & OCC											
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	50.	52.	54.	57.	56.	60.	62.	62.	58.	58.	17.

# CALIFORNIA

## WIND ROSES 5004 NATURAL BRIDGES





# 5167 CAPITOLA BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 11- 5-70 AND ENDING 6- 9-72.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)													
MEAN	1.37	1.59	1.58	1.64	1.34	1.38	1.05	1.52	1.98	1.22	1.92	2.12	1.60
STD DEV	.65	.70	.90	.91	.81	.59	.22	.75	.45	.43	1.56	1.00	.91
NO. OBS.	35.	34.	40.	42.	38.	21.	20.	21.	20.	18.	36.	43.	368.
<b>PERIOD (SEC)</b>													
MEAN	9.63	11.22	11.02	12.49	13.08	13.17	11.71	11.53	12.20	11.31	10.63	9.45	11.31
STD DEV	2.60	1.93	1.96	3.26	3.10	3.44	1.02	.77	.80	.57	2.32	2.11	2.63
NO. OBS.	39.	37.	39.	43.	37.	21.	19.	20.	20.	18.	36.	43.	372.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	3.23	0.00	0.00	0.00	0.00	0.00	0.00	11.43	0.00	1.45
3	92.11	100.00	97.37	96.67	87.88	89.47	100.00	100.00	100.00	100.00	80.00	87.80	93.33
4	7.89	0.00	0.00	0.00	0.00	10.53	0.00	0.00	0.00	0.00	6.57	12.20	3.77
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	2.63	0.00	12.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45
NO. OBS.	38.	37.	38.	30.	33.	19.	16.	20.	20.	18.	35.	41.	345.
<b>BREAKER TYPE</b>													
XOCC SPILL	23.08	6.06	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.28	5.41
SP/APL	76.92	87.88	92.11	86.05	89.74	85.71	100.00	100.00	100.00	100.00	72.22	83.72	87.57
PLUNGE	0.00	6.06	2.63	13.93	5.13	14.29	0.00	0.00	0.00	0.00	2.78	0.00	4.05
SURGE	0.00	0.00	0.00	0.00	5.13	0.00	0.00	0.00	0.00	0.00	25.00	0.00	2.97
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	39.	33.	38.	43.	39.	21.	20.	21.	20.	17.	36.	43.	370.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	-0.04	-0.09	-0.07	-0.04	-0.12	-0.03	-0.02	0.00	-0.08	-0.00	-0.01	-0.04	-0.05
GROSS MEAN	.04	.11	.08	.10	.13	.03	.02	.03	.08	.00	.03	.04	.06
STD DEV	.15	.20	.22	.16	.30	.07	.06	.07	.18	.02	.08	.11	.17
NO. OBS.	19.	16.	40.	63.	39.	20.	20.	21.	20.	17.	35.	43.	373.
<b>FORESHORE SLOPE</b>													
MEAN (DEG)	3.65	4.37	3.45	2.77	3.44	4.29	4.88	4.57	5.00	5.11	4.34	5.14	4.10
STD DEV	.89	1.35	1.48	1.09	.82	.46	.59	.68	.65	.32	1.45	.52	1.25
NO. OBS.	37.	35.	40.	43.	39.	21.	20.	21.	20.	18.	35.	43.	372.
<b>RIPS X OCC</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	19.	37.	40.	43.	40.	21.	20.	21.	20.	18.	36.	43.	378.
<b>CUSPS X OCC.</b>													
MEAN SPAC.	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.26
NO. OBS.	19.	37.	40.	43.	40.	21.	20.	21.	20.	18.	36.	43.	378.

# SUMMARY FOR PERIOD STARTING 11-5-70 AND ENDING 12-31-70.

## CALIFORNIA

## 5367 CAPITOLA BEACH

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SUMF OBS.													
WRIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	2.19	1.95
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	.87	1.10
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	16.	21.	37.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.30	8.19	9.10
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.05	1.85	2.63
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	16.	21.	37.
DIRECTION													
COASTAL SECTOR													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.67	0.00	11.43
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.33	75.00	65.71
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	25.00	22.86
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.	20.	35.
BREAKER TYPE													
XOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	18.92
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.50	66.67	54.05
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	2.70
BURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.25	0.00	24.32
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	16.	21.	37.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.02	-.07	-.03
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.06	.07	.07
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.12	.16	.13
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.	21.	36.
FORESHORT SLIPE													
MEAN (NEG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.06	5.33	5.22
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.77	.66	.71
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	16.	21.	37.
RIPS % OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	16.	21.	37.
CUSPS % OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	16.	21.	37.

SITE 7 CAPTAIN A BEACH			SUMMARY FOR PERIOD STARTING 1-4-71 AND ENDING 12-31-71											
			CALIFORNIA											
DATE	TIME	FROM	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT	OCT	NOV	DEC	ALL OBS.	
SURF OBS.														
MEAN (FT)	1.47	1.21	1.25	1.41	1.30	1.20	1.05	1.52	1.40	1.22	2.15	2.05	1.50	
STD DEV	.80	.45	.72	.50	.80	.41	.22	.75	.45	.45	1.75	1.15	.87	
NO. OBS.	17.	14.	20.	22.	20.	15.	20.	21.	20.	18.	20.	22.	229.	
PERIOD (SEC)														
MEAN	7.75	10.95	10.99	12.50	12.16	11.33	11.71	11.53	12.20	11.31	10.40	10.66	11.16	
STD DEV	2.17	2.80	1.86	1.59	1.57	1.67	1.02	.77	.80	.57	1.56	1.59	1.96	
NO. OBS.	20.	17.	19.	22.	19.	15.	19.	20.	20.	18.	20.	22.	231.	
DIRECTION														
COASTAL SETTING														
NO. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. 2	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. 3	45.00	100.00	94.44	88.89	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	97.57	
NO. 4	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46	
NO. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CALC.	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. OBS.	20.	17.	18.	9.	14.	15.	16.	20.	20.	18.	20.	21.	206.	
SURFACE TYPE														
SHOCC SETTL	45.00	14.29	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
SPILL	55.00	71.43	83.33	72.73	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	90.39	
FLING	0.00	14.29	5.56	27.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.95	
SHOCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CALC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. OBS.	20.	14.	14.	22.	20.	15.	20.	21.	20.	17.	20.	22.	229.	
CURRENT OBS.														
(1/2 SEC)	-0.05	-0.17	-0.14	-0.07	-0.10	-0.03	-0.02	0.00	-0.08	-0.00	0.00	0.00	-0.05	
NO. OBS.	20.	17.	20.	22.	20.	15.	20.	21.	20.	17.	20.	22.	234.	
FURROWING SURF														
MEAN (SEC)	5.24	4.00	2.20	3.41	3.20	4.33	4.85	4.57	5.00	5.11	5.74	4.95	4.05	
STD DEV	2.1	1.84	.89	.91	.83	.49	.59	.68	.65	.52	1.63	.21	1.26	
NO. OBS.	19.	17.	20.	22.	20.	15.	20.	21.	20.	18.	19.	22.	233.	
WIPES & OFF														
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. OBS.	20.	17.	20.	22.	20.	15.	20.	21.	20.	18.	20.	22.	235.	
CUTS & OFF														
MEAN SPAC.	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
STD DEV	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NO. OBS.	20.	17.	20.	22.	20.	15.	20.	21.	20.	18.	20.	22.	235.	

# 5367 CAPITOLA BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 3-72 AND ENDING 6- 9-72.

SURF OBS.

HEIGHT (FT)

MEAN  
STD DEV  
NO. OBS.

JAN

FEB

MARCH

APRIL

MAY

JUNE

JULY

AUG

SEPT

OCT

NOV

DEC

ALL OBS.

MEAN  
STD DEV  
NO. OBS.

PERIOD (SEC)

MEAN  
STD DEV  
NO. OBS.

DIRECTION  
COASTAL SECTOR

OCC. 1

2

3

4

5

CALM

NO. OBS.

BREAKER TYPE

NOCC SPILL

SP/PL

PLUNGE

SUNGE

CALM

NO. OBS.

CURRENT OBS.

(FT/SEC)

NET MEAN

GROSS MEAN

STD DEV

NO. OBS.

FORESHORE SLOPE

MEAN (DEC)

STD DEV

NO. OBS.

RIPS & OCC

MEAN SPAC.

NO. OBS.

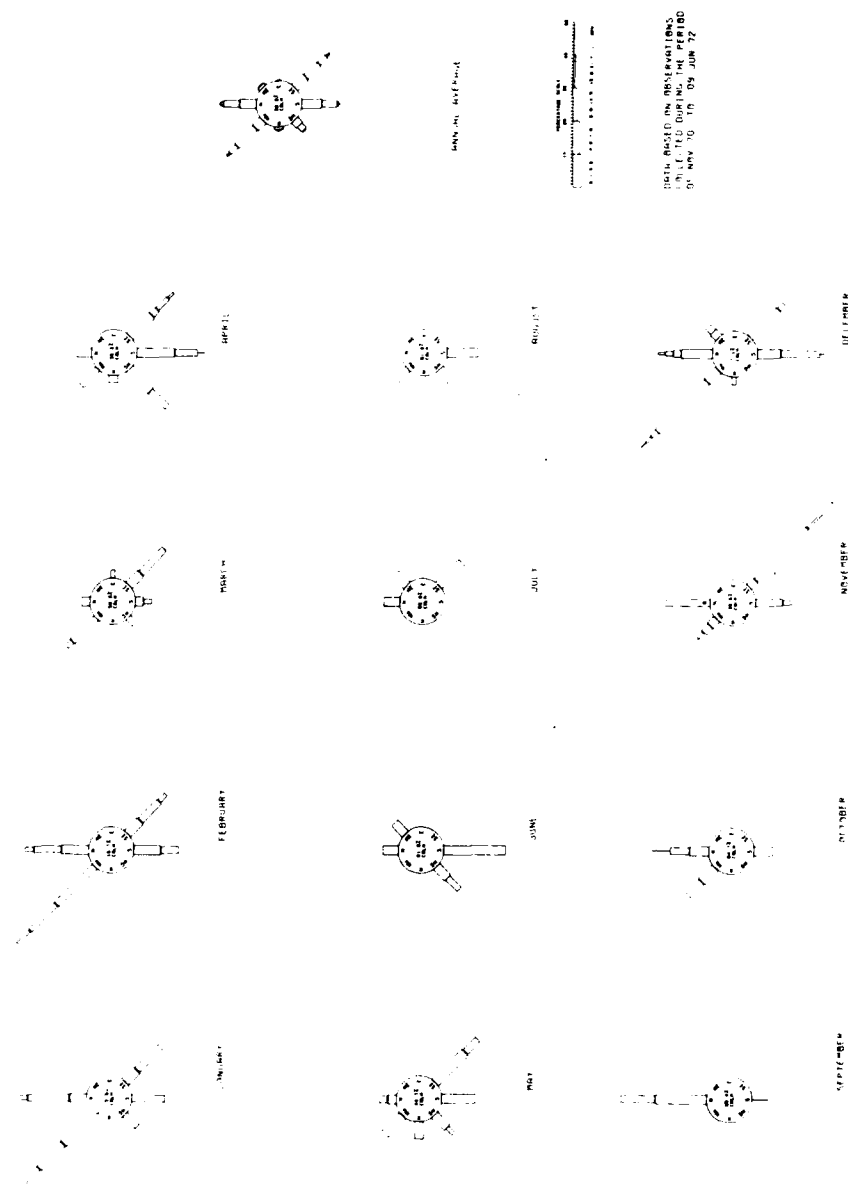
CUSPS & OCC.

MEAN SPAC.

NO. OBS.

# CALIFORNIA

## WIND ROSES 5367 CAPITALA



5005 TWIN LAKES		SUMMARY FOR PERIOD STARTING 9-1-68 AND ENDING 2-16-72												
		CALIFORNIA												
		JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.														
HEIGHT (FT)														
MEAN	3.19	3.02	3.09	2.79	2.87	2.87	2.87	2.93	3.14	2.76	3.10	3.32	3.41	3.05
STD DEV	1.46	1.30	1.19	1.12	1.16	1.21	1.21	1.18	1.53	1.35	1.43	1.44	1.69	1.34
NO. OBS.	58.	61.	66.	58.	52.	52.	52.	14.	21.	131.	91.	91.	91.	786.
PERIOD (SEC)														
MEAN	12.18	13.55	13.74	13.69	14.03	13.68	13.68	15.11	16.58	14.73	13.80	12.88	12.26	13.64
STD DEV	2.65	3.41	2.22	2.39	3.13	2.45	2.45	1.73	3.36	2.76	2.23	2.88	2.31	2.78
NO. OBS.	56.	60.	70.	61.	56.	51.	51.	13.	22.	131.	91.	89.	88.	764.
DIRECTION														
COASTAL SECTOR														
COCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4.00	0.00	11.11	0.00	7.69	9.09	9.09	0.00	5.86	8.89	8.82	0.00	4.88	5.49
3	46.00	80.95	86.97	92.91	92.31	90.91	90.91	100.00	88.24	88.00	79.41	94.29	95.12	86.81
4	0.00	19.05	22.22	9.59	0.00	0.00	0.00	0.00	4.88	8.89	11.76	5.71	0.00	7.33
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	0.00	0.00
NO. OBS.	25.	21.	18.	11.	13.	11.	11.	2.	17.	45.	34.	15.	41.	273.
COMPASS SECTOR														
COCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	29.	37.	48.	47.	41.	39.	39.	10.	5.	70.	51.	56.	49.	482.
BREAKER TYPE														
COCC SPILL	28.07	23.33	15.34	23.21	15.34	15.34	16.00	97.14	27.27	10.00	2.15	5.56	21.74	15.75
SP/APL	21.05	18.33	6.15	5.36	7.69	7.69	20.00	0.00	22.73	9.23	12.50	15.56	26.09	14.21
PLUNGE	49.12	51.67	73.85	67.66	76.42	64.00	64.00	35.71	50.00	80.77	82.80	77.78	51.09	68.12
SURGE	1.75	4.67	4.67	3.57	0.00	0.00	0.00	7.14	0.00	0.00	1.08	1.11	1.09	1.79
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	0.00
NO. OBS.	57.	60.	65.	56.	52.	50.	50.	14.	22.	130.	93.	40.	92.	781.
CURRENT OBS.														
(FT/SEC)														
MEAN	0.33	0.01	0.07	0.06	0.06	0.03	0.03	-0.01	0.08	0.01	0.17	0.12	0.03	-0.00
STD DEV	0.39	0.32	0.22	0.17	0.18	0.32	0.32	0.07	0.51	0.34	0.34	0.33	0.43	0.32
NO. OBS.	42.	39.	56.	60.	56.	41.	41.	6.	16.	84.	57.	51.	56.	526.
FORESHORE SLOPE														
MEAN (DEC)	5.07	5.78	4.84	3.11	3.44	3.70	3.70	4.30	4.13	4.64	7.76	8.06	6.83	5.00
STD DEV	2.24	2.08	2.33	1.58	2.02	1.42	1.42	1.16	1.09	2.52	3.39	2.42	2.32	2.81
NO. OBS.	47.	61.	40.	46.	34.	44.	44.	10.	16.	87.	54.	51.	54.	526.
RIPPS														
COCC	0.00	0.00	0.00	1.50	7.41	11.11	11.11	14.29	4.55	6.82	19.15	2.13	4.17	7.11
MEAN SPAC.	0.00	121.00	225.00	100.00	172.50	133.33	133.33	140.00	100.00	110.44	131.22	70.00	74.25	112.19
NO. OBS.	40.	62.	71.	61.	54.	54.	54.	14.	22.	132.	94.	44.	46.	816.
CUSPS														
COCC	0.67	15.87	21.13	89.68	61.11	70.37	70.37	68.29	77.27	48.70	26.60	3.19	7.29	29.99
MEAN SPAC.	111.75	78.60	67.73	100.40	85.64	99.24	99.24	108.33	62.06	45.67	132.28	120.00	94.00	100.96
NO. OBS.	60.	63.	71.	63.	54.	54.	54.	14.	22.	132.	94.	44.	46.	817.

# SANDS TWIN LAKES

## CALIFORNIA

SUMMARY FOR PERIOD STARTING 9- 1-68 AND ENDING 12-31-68.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09	2.96	2.74	2.02	2.66
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41	1.20	1.14	1.52	1.36
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	57.	51.	57.	50.	215.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.45	13.59	12.33	12.35	12.93
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	1.79	1.60	1.52	1.81
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	57.	48.	57.	46.	208.
DIRECTION													
COMPASS SECTOR													
% OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% OCC. NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% OCC. E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% OCC. SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% OCC. S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	7.64	3.57	8.16	6.10
% OCC. SW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.74	88.24	96.43	85.80	92.49
% OCC. W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% OCC. NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
% OCC. CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.92	0.00	2.04	1.41
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	57.	51.	56.	49.	213.
BREAKER TYPE													
XOCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.96	5.26	32.69	12.04
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.07	96.08	92.98	65.38	86.57
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	1.92	.93
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.00	0.00	.46
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	56.	51.	57.	52.	216.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.02	-.19	-.14	.00	.08
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.25	.24	.24	.20	.23
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.23	.29	.14	.26	.22
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	28.	27.	30.	26.	111.
FORESHORE SLOPE													
MEAN (DEC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	10.73	9.69	8.35	8.94
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	1.99	1.79	1.55	2.61
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	27.	26.	29.	26.	108.
RIPS % OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.92	0.00	3.64	1.02
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.00	0.00	112.50	45.51
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	57.	51.	47.	55.	220.
CUSPS % OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.79	0.00	0.00	7.27	5.91
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.33	0.00	0.00	105.75	43.88
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	57.	51.	57.	55.	220.

# SUMMARY FOR PERIOD STARTING 1- 1-69 AND ENDING 9-25-69.

## CALIFORNIA

## SAN JOAQUIN LAKES

SURF OBS.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)													
MEAN	2.93	2.75	3.43	2.93	2.92	2.13	3.00	3.00	3.92	0.00	0.00	0.00	3.04
STD DEV	1.57	.50	1.40	1.04	1.16	.83	1.21	1.58	1.08	0.00	0.00	0.00	1.36
NO. OBS.	30.	4.	14.	15.	12.	8.	12.	5.	12.	0.	0.	0.	112.
PERIOD (SEC)													
MEAN	11.81	10.13	13.38	14.05	15.63	16.60	14.95	15.90	17.87	0.00	0.00	0.00	14.17
STD DEV	2.04	2.10	1.51	1.68	1.71	1.73	1.83	1.79	4.15	0.00	0.00	0.00	2.95
NO. OBS.	24.	4.	18.	17.	12.	8.	11.	5.	12.	0.	0.	0.	115.
DIRECTION													
COMPASS SECTOR													
0 UCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	17.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.01
SW	75.86	100.00	100.00	100.00	100.00	100.00	100.00	100.00	15.38	0.00	0.00	0.00	83.78
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	3.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	3.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	29.	4.	15.	15.	12.	8.	10.	5.	13.	0.	0.	0.	111.
BREAKER TYPE													
RUCC SPILL	23.33	25.00	33.33	53.33	50.00	75.00	66.67	40.00	25.00	0.00	0.00	0.00	40.71
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	73.33	75.00	46.67	33.33	30.00	25.00	25.00	60.00	75.00	0.00	0.00	0.00	53.10
SURGE	3.33	0.00	20.00	13.33	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	6.19
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	30.	4.	15.	15.	12.	8.	12.	5.	12.	0.	0.	0.	113.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	.09	.21	-.10	-.03	.04	-.22	-.02	0.00	-.19	0.00	0.00	0.00	-.05
GROSS MEAN	.09	.21	.16	.13	.19	.22	.11	0.00	.25	0.00	0.00	0.00	.16
STD DEV	.15	.30	.17	.20	.22	.22	.16	0.00	.04	0.00	0.00	0.00	.13
NO. OBS.	14.	2.	14.	7.	9.	8.	4.	0.	8.	0.	0.	0.	66.
FORESHORE SLOPE													
MEAN (DEG)	6.95	8.50	6.21	3.91	6.50	6.00	4.75	0.00	4.55	0.00	0.00	0.00	5.98
STD DEV	1.05	2.38	1.53	.70	1.41	.76	.71	0.00	.32	0.00	0.00	0.00	1.52
NO. OBS.	20.	4.	14.	11.	8.	8.	8.	0.	11.	0.	0.	0.	84.
WIPS & UCC													
MEAN SPAC.	0.00	0.00	11.11	0.00	16.67	0.00	16.67	0.00	0.00	0.00	0.00	0.00	4.96
NO. OBS.	0.00	0.00	75.00	0.00	200.00	0.00	140.00	0.00	0.00	0.00	0.00	0.00	46.86
CUSPS & UCC													
MEAN SPAC.	3.15	0.00	16.67	35.29	50.33	50.00	58.33	20.00	38.46	0.00	0.00	0.00	28.10
NO. OBS.	32.	4.	18.	17.	12.	8.	12.	5.	13.	0.	0.	0.	64.57



## SUMMARY FOR PERIOD STARTING 2-1-70 AND ENDING 12-30-70.

SUMMARY FOR PERIOD STARTING 2- 1-70 AND ENDING 12-30-70													
CALIFORNIA													
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)	0.00	3.00	3.15	2.65	3.03	3.19	2.50	2.50	2.91	3.18	4.46	3.76	3.21
STD DEW	0.00	1.34	1.03	1.02	1.00	1.22	.71	.71	.92	1.01	1.24	1.38	1.27
NO. OBS.	0.	32.	33.	31.	32.	31.	2.	2.	43.	28.	26.	29.	289.
PERIOD (SEC)													
MEAN	0.00	13.02	13.03	13.43	15.10	13.46	16.00	15.10	14.26	13.40	13.21	12.57	13.36
STD DEV	0.00	1.45	1.35	2.31	1.38	1.65	.71	.85	1.11	2.26	1.66	2.61	1.81
NO. OBS.	0.	32.	33.	32.	33.	31.	2.	2.	43.	28.	24.	26.	287.
DIRECTION													
COASTAL SECTOR													
C. OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	74.07	85.00	92.54	96.55	88.29
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.41	0.00	7.41	0.00	3.60
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00
CALC.	0.00	0.	0.	0.	4.	0.	2.	2.	27.	20.	27.	29.	111.
NO. OBS.	0.	0.	0.	0.	4.	0.	2.	2.	27.	20.	27.	29.	111.
CROSS SECTOR													
C. OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	3.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	100.00	93.94	93.75	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	97.47
N	0.00	0.00	0.00	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALC.	0.00	0.00	3.03	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	33.	33.	32.	29.	31.	0.	0.	0.	0.	0.	0.	158.
BREAKER TYPE													
SUCC SPILL	0.00	28.13	9.38	6.90	0.00	7.14	0.00	0.00	2.33	0.00	0.00	3.37	6.43
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.33	14.24	40.00	53.57	10.71
PLUNGE	0.00	65.63	93.63	93.10	100.00	92.86	100.00	100.00	95.35	82.14	60.00	42.66	81.79
SURGE	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57	0.00	0.00	1.07
CALC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	32.	32.	29.	31.	28.	2.	2.	43.	28.	25.	28.	280.
CURRENT OBS. (FT/SEC)													
MEAN	0.00	0.05	.07	0.04	.11	.15	0.00	0.02	.10	0.09	.04	.24	.06
STD DEV	0.00	.13	.18	.11	.15	.29	0.00	.19	.19	.16	.28	.47	.21
NO. OBS.	0.	15.	23.	22.	22.	40.	0.00	.26	.32	.23	.41	.36	.29
BORTSMAN SLOPE													
MEAN (NEG)	0.00	4.77	3.38	2.38	2.67	2.78	2.50	2.00	3.07	5.20	6.21	5.38	3.72
STD DEV	0.00	1.07	1.46	1.27	.91	1.17	.71	0.00	.83	1.86	1.05	1.89	1.81
NO. OBS.	0.	22.	16.	26.	21.	23.	2.	1.	30.	15.	14.	16.	186.
RIPS & UCC													
MEAN SPAC.	0.00	2.94	0.00	0.00	0.00	0.00	0.00	0.00	4.65	10.34	0.00	3.45	2.33
NO. OBS.	0.	34.	34.	34.	33.	32.	2.	0.00	43.	110.00	0.00	50.00	40.01
CROSS & OCC.													
MEAN SPAC.	0.00	40.00	70.00	35.29	51.52	62.50	100.00	100.00	65.12	37.93	0.00	10.34	32.56
NO. OBS.	0.	34.	34.	34.	33.	32.	2.	2.	109.14	120.45	0.00	78.33	88.17
CROSS & OCC.													
MEAN SPAC.	0.00	40.00	70.00	35.29	51.52	62.50	100.00	100.00	65.12	37.93	0.00	10.34	32.56
NO. OBS.	0.	34.	34.	34.	33.	32.	2.	2.	109.14	120.45	0.00	78.33	88.17



# SUMMARY FOR PERIOD STARTING 1- 1-72 AND ENDING 2-16-72.

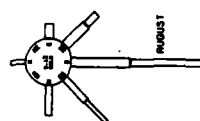
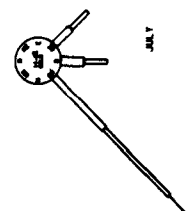
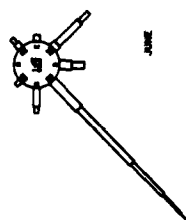
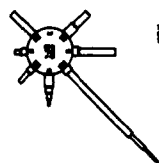
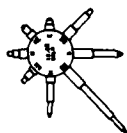
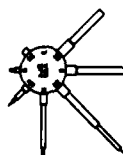
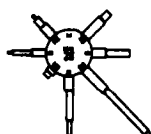
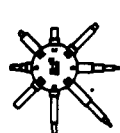
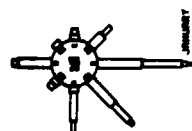
## CALIFORNIA

## 5005 TWIN LAKES

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL UBS.
SURF UBS.													
HEIGHT (FT)													
MEAN	4.20	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.13
STD DEV	1.32	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
PERIOD (SEC)													
MEAN	12.45	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.57
STD DEV	3.19	2.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
DIRECTION													
COASTAL SECTOR													
DEC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	90.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
BREAKER TYPE													
TOCC SPILL	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29
SP/PL	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.29
PLUNGE	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.43
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.
CURRENT UBS.													
(FT/SEC)													
NET MEAN	.89	.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.82
GROSS MEAN	.89	.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.85
STD DEV	.52	.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.34
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
FURROWS SLOPE													
MEAN (NEG)	4.70	6.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.27
STD DEV	1.49	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
RIPS & UCC													
MEAN SPAC.	0.00	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
CUSPS & OCC.													
MEAN SPAC.	0.00	112.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33
NO. OBS.	10.	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.

# CALIFORNIA

## WIND ROSES 05005 TWIN LAKES



DATA BASED ON OBSERVATIONS  
COLLECTED DURING THE PERIOD  
01 SEP 68 TO 16 FEB 72

ANNUAL AVERAGE



# 5001 NEW BRIGHTON CALIFORNIA SUMMARY FOR PERIOD STARTING 4- 6-68 AND ENDING 10- 4-71.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
<b>SURF OBS.</b>													
HEIGHT (FT)													
MEAN	2.55	1.82	2.87	2.75	2.83	1.82	1.37	1.44	2.15	2.22	1.42	2.39	2.13
STD DEV	1.36	1.40	1.33	2.33	1.87	.90	.84	.75	1.16	1.53	.79	1.27	1.46
NO. OBS.	37.	11.	37.	69.	62.	50.	49.	34.	33.	27.	36.	36.	483.
<b>PERIOD (SEC)</b>													
MEAN	10.32	11.01	13.48	11.95	12.16	11.07	11.07	10.82	12.06	12.16	12.31	13.80	11.86
STD DEV	3.96	3.87	1.92	2.75	2.89	3.08	2.89	2.39	4.06	1.94	3.33	2.99	3.05
NO. OBS.	36.	9.	36.	68.	63.	50.	49.	34.	33.	27.	33.	33.	475.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
0 OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
<b>COMPASS SECTOR</b>													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.21
S	85.00	63.64	22.84	74.63	40.32	91.84	65.31	67.70	42.42	34.62	32.43	8.57	52.74
SW	61.11	36.36	22.84	22.34	36.51	8.16	32.55	21.21	97.58	57.69	59.46	82.86	40.93
W	13.89	0.00	22.86	0.00	1.59	0.00	0.00	0.00	0.00	7.69	2.70	2.86	3.80
NW	0.00	0.00	2.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.21
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	36.	11.	35.	67.	63.	49.	49.	33.	33.	26.	37.	35.	474.
<b>BREAKER TYPE</b>													
BOCC SPILL	92.43	100.00	48.65	31.82	32.26	10.20	2.04	0.00	0.00	42.86	52.63	36.11	29.38
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	47.37	0.00	51.35	68.18	64.32	87.76	73.77	67.85	100.00	48.43	36.84	61.11	63.54
SURGE	0.00	0.00	0.00	0.00	3.23	2.04	24.89	32.35	0.00	10.71	5.26	0.00	6.46
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	2.78	.63
NO. OBS.	36.	11.	37.	66.	62.	49.	49.	34.	32.	26.	36.	36.	480.
<b>CURRENT OBS.</b>													
(FT/SEC)													
NET MEAN	-0.50	-0.15	-0.22	-0.18	-0.11	-0.06	-0.03	-0.01	-0.02	-0.06	-0.10	-0.20	-0.12
GROSS MEAN	.35	.28	.28	.21	.12	.12	.07	.05	.08	.24	.19	.50	.20
STD DEV	.45	.27	.22	.21	.14	.15	.13	.05	.06	.38	.23	.48	.30
NO. OBS.	24.	9.	26.	59.	37.	29.	33.	29.	31.	25.	23.	23.	328.
<b>FORESHORE SLOPE</b>													
MEAN (DEG)	9.96	6.33	4.99	3.87	3.95	5.62	6.50	5.90	8.01	7.20	7.15	6.41	5.86
STD DEV	2.31	1.00	1.62	2.23	2.36	2.23	2.36	3.57	5.31	4.35	2.92	2.28	3.36
NO. OBS.	24.	9.	22.	58.	43.	29.	36.	29.	31.	20.	26.	22.	327.
<b>RIPPS 3 OCC</b>													
MEAN SPAC.	0.00	19.18	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	2.78	.82
NO. OBS.	36.	11.	36.	69.	63.	50.	49.	34.	33.	28.	36.	36.	486.
<b>CUSPS 3 OCC.</b>													
MEAN SPAC.	10.93	19.18	42.11	49.28	44.48	50.00	8.16	0.00	0.00	0.00	10.26	2.78	24.18
NO. OBS.	36.	11.	36.	69.	63.	50.	49.	34.	33.	28.	36.	36.	486.

5001 NEA MIGHTON CALIFORNIA SUMMARY FOR PERIOD STARTING 4- 6-68 AND ENDING 6- 7-68.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MRS.
SURF MRS.													
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	2.13	2.20	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.15
STD DEV	0.00	0.00	0.00	.76	.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.69
NO. OBS.	0.	0.	0.	25.	15.	3.	0.	0.	0.	0.	0.	0.	41.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	10.98	9.94	10.43	0.00	0.00	0.00	0.00	0.00	0.00	10.56
STD DEV	0.00	0.00	0.00	1.41	2.59	1.76	0.00	0.00	0.00	0.00	0.00	0.00	1.99
NO. OBS.	0.	0.	0.	22.	16.	3.	0.	0.	0.	0.	0.	0.	41.
DIRECTION													
COMPASS SECTOR													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	63.64	48.75	100.00	0.00	0.00	0.00	0.00	0.00	0.00	67.50
SW	0.00	0.00	0.00	36.36	11.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.50
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	22.	16.	2.	0.	0.	0.	0.	0.	0.	40.
REFLECTOR TYPE													
EXCC SPILL	0.00	0.00	0.00	100.00	46.67	100.00	0.00	0.00	0.00	0.00	0.00	0.00	94.59
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	13.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.41
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	20.	15.	2.	0.	0.	0.	0.	0.	0.	37.
CURRENT MRS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	-0.10	-0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.08
GROSS MEAN	0.00	0.00	0.00	.14	.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.11
STD DEV	0.00	0.00	0.00	.19	.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.13
NO. OBS.	0.	0.	0.	13.	7.	2.	0.	0.	0.	0.	0.	0.	22.
FORESHORE SLOPE													
MEAN (NEG)	0.00	0.00	0.00	6.50	6.50	8.00	0.00	0.00	0.00	0.00	0.00	0.00	6.63
STD DEV	0.00	0.00	0.00	2.24	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95
NO. OBS.	0.	0.	0.	12.	10.	2.	0.	0.	0.	0.	0.	0.	24.
RIPS % OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	23.	16.	3.	0.	0.	0.	0.	0.	0.	42.
CUSPS % OCC.	0.00	0.00	0.00	52.17	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.95
MEAN SPAC.	0.00	0.00	0.00	104.42	35.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.70
NO. OBS.	0.	0.	0.	23.	16.	1.	0.	0.	0.	0.	0.	0.	42.

# SUMMARY FOR PERIOD STARTING 3- 9-69 AND ENDING 12-28-69.

## CALIFORNIA

## 5001 NEW HAVEN

### SUMF OBS.

MEAN (FT)

STD DEV

NO. OBS.

### PERIOD (SFC)

MEAN

STD DEV

NO. OBS.

### DIRECTION

### COMPASS SECTOR

OCC. N

SE

SW

S

SE

SW

SE

SW

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SW

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SE

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SE

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SW

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SW

SE

SW

SE

JAN

FEB

MARCH

APRIL

MAY

JUNE

JULY

AUG

SEPT

OCT

NOV

DEC

ALL OBS.

2.11

1.49

368.

12.14

2.98

360.

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# SUMMARY FOR PERIOD STARTING 10- 4-71 AND ENDING 10- 4-71.

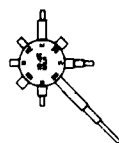
## CALIFORNIA

### 5001 NEW ORLEANS

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MHS.
SURF HRS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN (FT)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DIRECTION													
COASTAL SECTION													
NO. OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WATER TYPE													
WACC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CURRENT HRS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GROSS MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
FURT SHORE SLOPE													
MEAN (DEG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RIPS X OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CUSPS X OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. HRS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

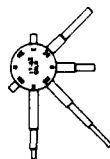
# CALIFORNIA

## WIND ROSES 5001 NEW BRIGHTON

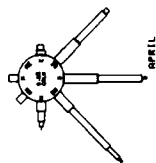


JANUARY

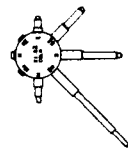
INSUFFICIENT DATA



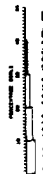
MARCH



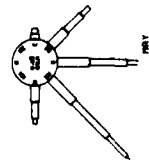
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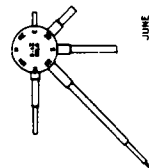
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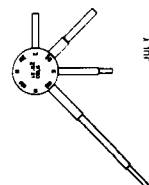
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OBTAINED FROM THE  
05 APR 58 TO 04 OCT 71



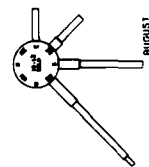
MAY



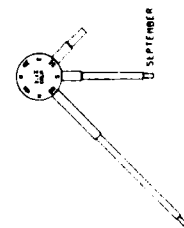
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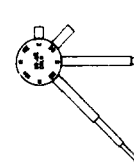
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AUGUST



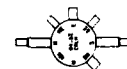
SEPTEMBER



OCTOBER



NOVEMBER



DECEMBER

5000 SEA CLIFF														CALIFORNIA														SUMMARY FOR PERIOD STARTING 4-6-68 AND ENDING 12-13-72													
				JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.																									
SURF OBS. HEIGHT (FT)																																									
MEAN				2.87	3.15	2.58	2.48	2.44	2.48	2.05	1.72	1.72	2.30	3.03	3.56	2.51																									
STD DEV				1.48	1.57	1.38	1.05	1.09	.95	.89	1.00	.91	.98	1.40	1.51	1.30																									
NO. OBS.				50.	37.	55.	63.	61.	63.	63.	64.	66.	47.	40.	66.	681.																									
PERIOD (SEC)																																									
MEAN				10.84	11.20	12.72	10.85	11.70	12.13	12.33	12.57	14.25	10.90	11.01	11.15	11.68																									
STD DEV				2.75	3.49	3.41	2.62	3.56	2.69	3.03	4.61	4.08	3.44	3.18	3.56																										
NO. OBS.				50.	38.	55.	66.	66.	65.	62.	66.	67.	46.	40.	66.	693.																									
DIRECTION COASTAL SECTOR																																									
0 OCC. 1				0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	3.33	0.00	0.00	0.00	.61																									
2				0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38	0.00	0.00	0.00	0.00	3.25																									
3				40.80	75.00	100.00	83.33	80.00	82.50	95.45	90.48	86.67	70.83	38.89	50.00	78.86																									
4				20.80	18.87	0.00	0.00	20.00	12.50	0.00	7.14	8.87	12.50	61.11	35.00	14.23																									
5				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03																									
CALM				0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	6.33	0.00	0.00	0.00																									
NO. OBS.				20.	12.	25.	12.	3.	16.	22.	42.	33.	20.	18.	20.	246.																									
COMPASS SECTOR																																									
0 OCC. N				0.00	3.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	.24																									
NE				0.00	0.00	0.00	0.00	0.00	0.00	5.00	4.35	0.00	0.00	0.00	0.00	.71																									
E				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																									
SE				5.71	8.00	3.33	3.92	3.70	0.00	0.00	4.35	0.00	0.00	0.00	6.12	3.09																									
S				34.20	24.00	36.00	47.06	27.78	30.95	15.00	17.39	46.88	50.00	20.00	6.36	36.10																									
SW				60.00	66.00	66.67	45.10	68.52	66.05	77.50	71.91	53.13	50.00	80.00	24.49	59.38																									
W				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																									
NW				0.00	0.00	0.00	3.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.48																									
CALM				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																									
NO. OBS.				15.	45.	30.	51.	54.	42.	40.	23.	32.	20.	20.	49.	421.																									
BREAKER TYPE																																									
SOCC SPILL				33.33	13.51	24.07	47.09	27.87	21.54	27.42	28.36	28.99	8.51	7.50	27.94	26.12																									
SP/PL				12.00	13.61	18.52	12.31	14.64	7.69	19.35	30.33	15.94	4.24	15.00	7.35	13.64																									
PLUNGE				24.07	45.05	37.76	18.92	40.98	40.00	30.65	25.37	10.14	34.04	52.50	48.53	31.93																									
BURGE				29.63	29.73	29.63	23.08	29.51	30.77	22.58	11.94	48.93	51.06	25.00	16.18	28.16																									
CALM				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.15																									
NO. OBS.				54.	37.	54.	65.	61.	65.	62.	67.	69.	47.	40.	68.	689.																									
CURRENT OBS. (FT/SEC)																																									
NET MEAN				-0.27	-0.29	-0.26	-0.37	-0.27	-0.24	-0.15	-0.08	-0.09	-0.15	-0.17	-0.21	-0.20																									
GROSS MEAN				.40	.37	.31	.41	.33	.31	.22	.17	.16	.24	.18	.32	.28																									
STD DEV				.46	.48	.25	.40	.35	.28	.20	.17	.19	.24	.18	.30	.31																									
NO. OBS.				38.	29.	51.	52.	46.	60.	59.	65.	67.	46.	33.	61.	607.																									
FORESHORE SLOPE																																									
MEAN (DEG)				6.15	5.03	3.98	6.12	8.17	8.08	8.60	9.00	9.97	8.74	8.56	5.62	7.44																									
STD DEV				3.57	2.45	1.04	2.36	2.30	2.99	3.04	3.19	2.62	2.62	4.66	2.98	3.19																									
NO. OBS.				48.	37.	52.	51.	47.	58.	59.	64.	67.	47.	38.	65.	629.																									
RIPS 3 OCC				3.51	2.63	14.29	9.09	7.81	7.98	1.59	2.99	2.00	8.33	0.00	2.62	5.39																									
MEAN SPAC.				160.00	100.00	205.03	360.67	172.00	300.00	170.00	55.00	230.00	343.75	0.00	250.00	209.81																									
NO. OBS.				57.	38.	50.	66.	66.	60.	63.	67.	69.	48.	40.	71.	705.																									
CUSPS 3 OCC.				7.02	23.68	81.07	39.39	29.69	22.73	9.52	0.52	2.00	8.33	22.50	19.72	18.58																									
MEAN SPAC.				177.50	93.33	97.39	71.73	82.11	87.33	59.17	0.52	87.50	68.75	71.11	72.14	75.25																									
NO. OBS.				57.	38.	56.	66.	66.	66.	63.	67.	69.	48.	40.	71.	705.																									

# 500A SEA CLIFF CALIFORNIA SUMMARY FOR PERIOD STARTING 4- 6-68 AND ENDING 12-31-68.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF ORS.													
HEIGHT (FT)													
MEAN	0.00	0.00	0.00	2.17	2.53	2.76	2.39	2.80	2.38	2.75	3.52	3.76	2.82
STD DEV	0.00	0.00	0.00	.76	.74	.72	.66	.56	.87	.71	.98	1.02	.97
NO. OBS.	0.	0.	0.	29.	34.	25.	23.	15.	13.	8.	21.	34.	202.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	9.78	11.16	11.51	12.03	11.85	11.86	12.44	11.40	11.64	11.34
STD DEV	0.00	0.00	0.00	2.20	3.31	2.04	2.35	1.34	2.33	1.84	2.65	1.96	2.44
NO. OBS.	0.	0.	0.	31.	35.	27.	23.	15.	13.	7.	21.	34.	206.
DIRECTION													
COMPASS SECTION													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ME	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	7.14	6.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	60.71	36.36	44.44	13.04	0.00	8.33	0.00	20.00	55.88	34.00
SW	0.00	0.00	0.00	25.00	57.58	55.56	88.96	100.00	91.67	100.00	80.00	35.29	61.50
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	28.	33.	27.	23.	15.	12.	8.	20.	14.	200.
BREAKER TYPE													
XOCC SPILL	0.00	0.00	0.00	70.00	24.24	18.52	13.64	6.67	23.08	0.00	9.52	29.41	26.11
SP/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	10.00	39.39	59.26	50.00	60.00	23.08	75.00	80.95	67.65	49.75
SURGE	0.00	0.00	0.00	20.00	36.36	22.22	36.36	33.33	53.85	25.00	9.52	2.94	24.14
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	30.	33.	27.	22.	15.	13.	8.	21.	34.	203.
CURRENT ORS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	-.31	-.21	-.19	-.11	-.05	-.09	-.03	-.24	-.13	-.16
GROSS MEAN	0.00	0.00	0.00	-.36	-.29	-.25	-.12	-.14	-.12	-.06	-.24	-.17	-.21
STD DEV	0.00	0.00	0.00	.37	.33	.25	.11	.16	.16	.08	.19	.15	.22
NO. OBS.	0.	0.	0.	20.	23.	22.	19.	15.	13.	7.	18.	30.	167.
FORESHORE SLOPE													
MEAN (DEG)	0.00	0.00	0.00	7.45	8.26	9.71	11.26	13.50	12.08	10.00	12.53	6.47	9.60
STD DEV	0.00	0.00	0.00	1.99	1.94	3.76	2.56	1.91	3.23	1.80	4.36	3.55	3.75
NO. OBS.	0.	0.	0.	20.	23.	21.	19.	14.	13.	8.	15.	30.	163.
RIPS % OCC.	0.00	0.00	0.00	3.23	5.71	14.29	0.00	0.00	0.00	0.00	0.00	2.86	3.83
MEAN SPAC.	0.00	0.00	0.00	50.00	75.00	400.00	0.00	0.00	0.00	0.00	0.00	200.00	107.06
NO. OBS.	0.	0.	0.	31.	35.	24.	23.	15.	13.	8.	21.	35.	209.
CUSPS % OCC.	0.00	0.00	0.00	41.94	14.29	3.97	0.00	0.00	0.00	12.50	38.10	8.57	14.83
MEAN SPAC.	0.00	0.00	0.00	87.31	112.00	150.00	0.00	0.00	0.00	50.00	76.25	30.00	66.40
NO. OBS.	0.	0.	0.	31.	35.	24.	23.	15.	13.	8.	21.	35.	209.

SUMMARY FOR PERIOD STARTING 1- 1-69 AND ENDING 12-30-69.											
SNOA SEA CLIFF											
CALIFORNIA											
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
SURF OBS.											
HEIGHT (FT)	2.71	3.62	2.84	3.05	2.95	2.15	2.47	2.00	1.95	3.08	0.00
STD DEV	1.34	1.47	.99	1.24	1.53	.67	.87	.82	.83	.64	0.00
NO. OBS.	24.	21.	25.	21.	22.	20.	17.	7.	20.	13.	0.
PERIOD (SEC)											
MEAN	10.55	11.03	12.37	11.35	12.55	12.21	10.53	12.44	15.92	12.04	0.00
STD DEV	3.96	3.61	2.76	2.98	3.31	1.84	3.20	1.32	3.17	3.11	0.00
NO. OBS.	24.	21.	25.	22.	24.	20.	16.	8.	20.	13.	0.
DIRECTION											
COMPASS SECTOR											
D. OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	11.74	12.50	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	7.14	9.52	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	17.46	9.52	16.00	27.27	14.29	6.97	17.65	12.50	70.00	83.33	0.00
SW	75.00	80.95	80.00	72.73	85.71	93.33	64.71	25.00	30.00	16.67	0.00
W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	24.	21.	25.	22.	21.	15.	17.	8.	20.	12.	0.
BREAKER TYPE											
BOCC SPILL	23.08	15.00	12.50	31.82	30.43	15.00	47.06	87.50	45.00	30.77	0.00
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	38.46	60.00	30.00	31.82	32.17	35.00	33.29	12.50	15.00	61.54	0.00
SURE	38.46	25.00	37.50	36.36	17.39	50.00	17.65	0.00	40.00	7.69	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	26.	20.	24.	22.	23.	20.	17.	8.	20.	13.	0.
CURRENT OBS.											
(F1/SEC)											
NET MEAN	.00	.13	-.26	-.34	-.35	-.18	-.15	-.03	-.05	-.30	0.00
GROSS MEAN	.16	.23	.29	.36	.38	.31	.19	.13	.05	.42	0.00
STD DEV	.15	.20	.22	.43	.45	.28	.11	.13	.11	.27	0.00
NO. OBS.	21.	21.	22.	19.	18.	20.	17.	8.	20.	13.	0.
FOR SHORE SLOPE											
MEAN (DEG)	8.76	5.43	4.09	5.47	8.74	7.21	8.88	10.13	10.94	10.42	0.00
STD DEV	3.73	2.27	.75	1.81	2.26	1.47	1.96	2.42	1.43	4.23	0.00
NO. OBS.	21.	21.	22.	19.	19.	19.	17.	8.	18.	12.	0.
RIPS & OCC											
MEAN SPAC.	0.00	4.76	32.00	22.73	12.50	0.00	0.00	12.50	0.00	30.77	0.00
NO. OBS.	24.	100.00	205.83	430.00	236.67	0.00	0.00	40.00	0.00	343.75	0.00
NO. OBS.	24.	21.	25.	22.	24.	20.	17.	8.	20.	13.	0.
CUSPS & OCC.											
MEAN SPAC.	3.45	23.41	72.00	54.55	58.33	45.00	17.65	0.00	0.00	23.08	0.00
NO. OBS.	145.00	86.60	98.33	53.75	71.43	61.67	43.33	0.00	0.00	75.00	0.00
NO. OBS.	24.	21.	25.	22.	24.	20.	17.	8.	20.	13.	0.

STIMULANT FOR PENSION STARTING 1-2-70 AND ENDING 12-22-70.

CALIFORNIA														SUMMARY FOR PERIOD STARTING 1-2-70 AND ENDING 12-22-70													
TIME RMS		JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MOS.													
MEAN (DB)		0.43	0.50	0.60	2.00	2.25	2.82	1.50	1.62	1.36	2.25	2.50	1.67	2.40													
STD DEV		1.72	1.20	.40	0.00	.50	1.25	.85	.87	.50	1.26	.71	.56	1.08													
NO. OBS.		7.	5.	5.	3.	0.	11.	10.	15.	11.	0.	2.	3.	81.													
STATION (SCL)																											
MEAN		1.08	12.13	11.24	10.03	12.33	12.35	15.46	15.72	20.00	13.63	14.80	15.07	14.28													
STD DEV		2.13	4.00	5.44	2.03	0.02	2.71	2.12	3.96	3.08	6.18	5.11	1.69	4.34													
NO. OBS.		7.	0.	5.	3.	0.	11.	14.	13.	9.	4.	2.	1.	79.													
TEMPERATURE																											
CRUSTAL SPLIT																											
MEAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
STD DEV		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
NO. OBS.		0.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
COMPASS SPLIT																											
MEAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
STD DEV		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
NO. OBS.		0.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
MEAN (DB)		71.43	25.00	40.00	100.00	50.00	45.05	7.10	7.14	18.18	0.00	0.00	0.00	20.03													
STD DEV		0.00	0.00	0.00	0.00	0.00	36.30	71.43	71.43	81.62	50.00	100.00	100.00	9.74													
NO. OBS.		14.20	25.00	20.00	0.00	0.00	9.09	7.14	14.29	0.00	25.00	0.00	0.00	14.63													
STATION (SCL)																											
MEAN		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
STD DEV		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
NO. OBS.		7.	0.	5.	3.	0.	11.	10.	10.	11.	0.	2.	3.	82.													
CURRENT RMS																											
(F1/SCL)																											
MEAN		-0.70	-1.25	-0.12	-0.93	-0.28	-0.44	-0.22	-0.19	-0.14	-0.22	-0.16	-0.43	-0.36													
STD DEV		0.00	1.25	.42	.93	.41	.40	.37	.21	.18	.48	.36	.43	.45													
NO. OBS.		7.	0.	5.	3.	0.	11.	14.	14.	11.	4.	2.	3.	62.													
EARTHQUAKE SPLIT																											
MEAN (DB)		3.20	0.75	3.60	2.67	0.75	7.04	2.71	9.00	4.04	8.50	9.50	5.00	7.50													
STD DEV		1.00	2.55	.55	5.03	.94	2.62	2.74	1.84	1.34	1.73	3.54	1.00	2.94													
NO. OBS.		7.	0.	5.	3.	0.	11.	14.	10.	11.	4.	2.	3.	80.													
RIPS & ILL		28.57	0.00	0.00	0.00	0.00	9.09	7.14	7.14	0.00	0.00	0.00	0.00	0.00													
MEAN SPAC.		100.00	0.00	0.00	0.00	0.00	200.00	170.00	70.00	0.00	0.00	0.00	0.00	0.00													
NO. OBS.		7.	0.	5.	3.	0.	11.	14.	10.	11.	4.	2.	3.	82.													
CUSPS & ILL		28.57	25.00	80.00	33.33	0.00	9.09	7.14	0.00	0.00	0.00	0.00	0.00	0.00													
MEAN SPAC.		100.00	100.00	100.00	85.00	0.00	300.00	70.00	0.00	0.00	0.00	0.00	0.00	0.00													
NO. OBS.		7.	0.	5.	3.	0.	11.	14.	14.	11.	4.	2.	3.	82.													

SUMMARY FOR PERIOD STARTING 1- 3-71 AND ENDING 12-25-71.

SUMMARY FOR PERIOD STARTING 1-3-71 AND ENDING 12-25-71													
CALIFORNIA													
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL YRS.
SOUTH SEA (116)													
SUMS DMS.													
WATERS (FT)													
WATERS	2.11	2.50	2.12	1.43	2.00	1.00	1.00	1.15	1.33	1.44	2.53	2.67	1.79
STW DMS	.74	2.12	1.11	.41	0.00	0.00	0.00	.43	.92	.78	1.70	1.11	1.14
NO. DMS.	9.	2.	17.	6.	1.	3.	5.	26.	24.	25.	17.	15.	147.
PACIFIC (117)													
WATERS (FT)													
WATERS	10.47	14.25	13.62	14.38	7.40	16.33	11.54	11.76	12.04	9.24	10.09	9.93	11.39
STW DMS	4.00	2.47	3.60	3.35	0.00	4.96	2.20	4.44	3.04	2.75	3.51	4.65	4.49
NO. DMS.	9.	2.	17.	6.	1.	3.	5.	27.	25.	22.	17.	16.	150.
PACIFIC (118)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	4.76	0.00	0.00	0.00	1.41
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	.70
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	76.06
PACIFIC (119)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.90
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.52
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41
PACIFIC (120)													
WATERS (FT)													
WATERS	35.33	0.00	41.14	0.00	0.00	33.33	100.00	37.04	24.00	0.00	5.44	25.00	24.67
STW DMS	45.56	50.00	52.90	100.00	100.00	33.33	0.00	40.74	8.00	0.00	23.53	12.50	28.00
NO. DMS.	11.11	50.00	5.44	0.00	0.00	0.00	0.00	14.52	4.00	0.00	23.53	6.25	10.00
PACIFIC (121)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	33.33	0.00	3.70	64.00	90.91	47.06	56.25	36.67
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	.67
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.	17.	16.	150.
PACIFIC (122)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (123)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (124)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (125)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (126)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (127)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (128)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (129)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (130)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (131)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (132)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (133)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (134)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (135)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (136)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (137)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (138)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (139)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (140)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (141)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (142)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (143)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. DMS.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PACIFIC (144)													
WATERS (FT)													
WATERS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STW DMS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

# SUMMARY FOR PERIOD STARTING 1- 6-72 AND ENDING 12-13-72.

## CALIFORNIA

## 5006 SEA CLIFF

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MOS.
<b>SURF OBS.</b>													
<b>HEIGHT (FT)</b>													
<b>MEAN</b>	2.67	2.50	1.50	3.00	0.00	2.25	1.50	1.00	0.00	0.00	0.00	1.00	2.17
<b>STD DEV</b>	1.50	1.51	1.20	1.41	0.00	1.50	.58	0.00	0.00	0.00	0.00	0.00	1.39
<b>NO. OBS.</b>	12.	10.	8.	4.	0.	4.	4.	3.	0.	0.	0.	1.	46.
<b>PERIOD (SEC)</b>													
<b>MEAN</b>	11.71	10.62	12.00	11.38	0.00	12.43	11.25	10.10	0.00	0.00	0.00	0.00	11.53
<b>STD DEV</b>	3.62	3.14	3.61	.85	0.00	1.43	1.71	2.01	0.00	0.00	0.00	0.00	2.95
<b>NO. OBS.</b>	12.	11.	4.	4.	0.	4.	4.	3.	0.	0.	0.	0.	46.
<b>DIRECTION</b>													
<b>COASTAL SECTOR</b>													
<b>NO. OCC.</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>2</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>3</b>	66.67	80.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	0.00	0.00	100.00	84.84
<b>4</b>	33.33	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33
<b>5</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CALM</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NO. OBS.</b>	12.	10.	4.	4.	0.	3.	4.	3.	0.	0.	0.	1.	45.
<b>BREAKER TYPE</b>													
<b>SPILL</b>	33.33	9.09	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.89
<b>SP/PL</b>	16.67	27.27	12.50	50.00	0.00	0.00	50.00	66.67	0.00	0.00	0.00	0.00	25.53
<b>PLUNGE</b>	0.33	27.27	12.50	25.00	0.00	50.00	25.00	0.00	0.00	0.00	0.00	0.00	19.15
<b>SURGE</b>	41.67	36.36	62.50	25.00	0.00	50.00	25.00	33.33	0.00	0.00	0.00	0.00	40.43
<b>CALM</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NO. OBS.</b>	12.	11.	8.	4.	0.	4.	4.	3.	0.	0.	0.	1.	47.
<b>CURRENT OBS.</b>													
<b>(FT/SEC)</b>													
<b>NET MEAN</b>	0.00	-0.09	-0.26	-0.40	0.00	-0.40	-0.13	.06	0.00	0.00	0.00	0.00	-0.24
<b>GROSS MEAN</b>	0.00	.42	.26	.40	0.00	.40	.34	.21	0.00	0.00	0.00	0.00	.33
<b>STD DEV</b>	0.00	.60	.37	.46	0.00	.47	.34	.31	0.00	0.00	0.00	0.00	.23
<b>NO. OBS.</b>	1.	2.	7.	4.	0.	4.	4.	2.	0.	0.	0.	0.	24.
<b>FORESHORE SLOPE</b>													
<b>MEAN (DLC)</b>	4.45	3.50	3.00	3.33	0.00	5.25	5.00	5.33	0.00	0.00	0.00	0.00	4.07
<b>STD DEV</b>	1.44	.47	.53	.58	0.00	.50	0.00	.58	0.00	0.00	0.00	0.00	1.22
<b>NO. OBS.</b>	11.	10.	8.	3.	0.	4.	4.	3.	0.	0.	0.	0.	43.
<b>RIPS 3 OCC</b>													
<b>MEAN SPAC.</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NO. OBS.</b>	12.	11.	8.	4.	0.	4.	4.	3.	0.	0.	0.	1.	47.
<b>CUSPS 3 OCC.</b>													
<b>MEAN SPAC.</b>	0.00	27.27	0.00	0.00	0.00	75.00	25.00	0.00	0.00	0.00	0.00	0.00	14.89
<b>NO. OBS.</b>	12.	11.	8.	4.	0.	4.	4.	3.	0.	0.	0.	1.	37.57



WIND ROSES FOR 05006--SEA CLIFF  
(not available)

SUMMARY FOR PERIOD STARTING 5-10-68 AND ENDING 3-6-73.

5007 SUNSET BEACH			CALIFORNIA												SUMMARY FOR PERIOD STARTING 5-10-68 AND ENDING 3- 6-73											
			JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL MOS.											
SURF OBS.																										
HEIGHT (FT)																										
MEAN			3.35	2.90	3.00	2.62	2.91	2.90	3.58	3.40	3.35	4.35	4.38	4.02	3.49											
STD DEV			1.28	.64	.75	.78	1.09	.67	1.02	1.11	1.04	1.35	1.41	2.04	1.53											
NO. OBS.			63.	42.	19.	29.	81.	89.	67.	58.	72.	77.	77.	61.	715.											
PERIOD (SEC)																										
-PLAN			11.27	10.83	11.43	10.81	11.29	10.25	12.03	13.30	13.12	12.62	11.89	11.93	11.88											
STD DEV			1.56	2.08	1.63	1.70	2.69	2.14	3.62	3.16	2.81	2.17	2.23	2.43	2.66											
NO. OBS.			63.	40.	19.	27.	81.	86.	66.	54.	75.	76.	79.	59.	709.											
DIRECTION																										
COASTAL SECTOR																										
OCC.			1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
2			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
3			100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	83.33	5.00	0.00	0.00	0.00											
4			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	83.33	95.00	94.76	97.83	97.83											
5			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	2.17	.87											
CALM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	83.33	0.00	0.00	0.00	.44											
NO. OBS.			42.	33.	12.	11.	30.	3.	6.	1.	12.	20.	19.	46.	229.											
CUMPASS SECTOR																										
OCC.			1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
2			0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
3			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
4			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
5			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
CALM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.			15.	7.	7.	18.	49.	62.	67.	57.	59.	57.	60.	13.	471.											
BREAKER TYPE																										
ZOC SPILL			35.48	26.19	40.00	72.81	73.32	95.31	98.46	94.28	88.97	66.23	55.70	8.47	66.05											
SP/PL			86.37	56.76	50.00	20.69	15.58	4.49	0.00	1.72	4.00	5.19	17.72	27.12	17.11											
PLUNGE			16.13	19.05	10.00	6.90	5.19	0.00	1.54	0.00	9.33	2.27	26.58	64.41	16.12											
SURGE			1.61	0.00	0.00	0.00	3.40	0.00	0.00	0.00	0.00	1.30	0.00	0.00	.71											
CALM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
NO. OBS.			62.	42.	20.	29.	77.	84.	93.	58.	75.	77.	79.	59.	707.											
CURRENT OBS.																										
(FT/SEC)																										
MEAN			-0.30	-0.10	-0.19	-0.32	-0.48	-0.55	-0.69	-0.88	-0.42	-0.50	-1.08	-0.47	-0.51											
GROSS MEAN			-0.2	.72	.88	.76	.78	.95	1.04	1.10	.84	.94	1.08	.67	.83											
STD DEV			.50	.50	.31	.61	.70	.68	.49	.62	.77	.60	.68	.67	.65											
NO. OBS.			99.	34.	21.	28.	60.	43.	16.	38.	46.	53.	48.	58.	524.											
TORSION SLOPE																										
MEAN (DEG)			2.81	2.90	2.55	2.61	3.18	3.30	4.32	6.23	4.90	6.43	4.31	3.16	3.78											
STD DEV			1.29	1.41	.94	.43	1.15	.91	1.61	.96	1.26	2.47	1.65	1.44	1.65											
NO. OBS.			62.	42.	20.	29.	61.	40.	16.	37.	49.	49.	49.	55.	519.											
RIPS & OCC			16.95	11.90	9.59	24.57	1.24	0.00	1.49	0.00	1.30	15.19	2.53	10.71	6.71											
MEAN SPAC.			242.00	420.00	175.00	420.00	420.00	200.00	200.00	200.00	402.00	210.83	200.00	500.00	270.07											
NO. OBS.			59.	42.	21.	29.	40.	69.	27.	54.	77.	79.	79.	56.	715.											
CUSPS & OCC.			20.31	9.76	0.00	0.00	2.78	2.99	0.07	0.00	1.30	7.59	10.13	11.24	6.15											
MEAN SPAC.			233.86	337.50	0.00	0.00	50.00	60.00	0.07	0.00	200.00	130.83	156.25	101.63	115.29											
NO. OBS.			68.	41.	17.	17.	73.	67.	67.	58.	77.	79.	79.	62.	701.											

5007 SUNSPY BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 5-10-68 AND ENDING 11-30-68.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF DIRS.													
WEIGHT (FT)													
MEAN	0.00	0.00	0.00	0.00	3.22	2.87	3.62	3.43	3.53	4.93	4.70	0.00	3.79
STD DEV	0.00	0.00	0.00	0.00	1.06	.67	1.01	1.14	.88	.91	1.34	0.00	1.24
NO. OBS.	0.	0.	0.	0.	41.	55.	60.	53.	55.	54.	60.	0.	378.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	0.00	10.90	9.98	12.53	13.61	13.49	13.49	12.27	0.00	12.39
STD DEV	0.00	0.00	0.00	0.00	2.16	1.92	3.67	3.10	2.71	1.70	1.56	0.00	2.82
NO. OBS.	0.	0.	0.	0.	41.	52.	60.	53.	57.	54.	60.	0.	377.
DIRECTION													
COMPASS SECTOR													
0 OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	7.50	26.92	1.67	0.00	0.00	0.00	0.00	0.00	4.86
S	0.00	0.00	0.00	0.00	7.50	21.15	1.67	0.00	0.00	0.00	0.00	0.00	5.41
SW	0.00	0.00	0.00	0.00	75.00	36.54	30.00	35.85	15.69	0.00	0.00	0.00	25.41
W	0.00	0.00	0.00	0.00	7.50	1.85	61.67	64.15	78.43	94.15	98.33	0.00	61.62
NW	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	.54
CALM	0.00	0.00	0.00	0.00	2.50	11.54	0.00	0.00	0.00	0.00	0.00	0.00	1.89
NO. OBS.	0.	0.	0.	0.	40.	52.	60.	53.	51.	54.	60.	0.	370.
BREAKER TYPE													
TOCC SPILL	0.00	0.00	0.00	0.00	92.31	100.00	98.28	100.00	100.00	71.15	73.33	0.00	90.51
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	0.00	0.00	0.00	1.72	0.00	0.00	0.00	0.00	0.00	8.67
SURGE	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.61
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	0.	39.	50.	58.	53.	57.	52.	60.	0.	369.
CURRENT DIRS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	0.00	-77	-73	-62	-76	-43	-50	-1.12	0.00	-71
GROSS MEAN	0.00	0.00	0.00	0.00	.96	.87	.91	1.02	.76	.98	1.11	0.00	.95
STD DEV	0.00	0.00	0.00	0.00	.94	1.01	.29	.39	.36	.39	.62	0.00	.60
NO. OBS.	0.	0.	0.	0.	21.	29.	29.	29.	27.	28.	31.	0.	194.
FURROWS SLOPE													
MEAN (NEG)	0.00	0.00	0.00	0.00	3.04	3.12	4.07	4.12	5.07	8.36	4.67	0.00	4.65
STD DEV	0.00	0.00	0.00	0.00	.82	.71	1.24	.73	1.11	2.00	1.49	0.00	2.10
NO. OBS.	0.	0.	0.	0.	23.	24.	27.	25.	30.	25.	30.	0.	186.
RIPS & OCC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	.53
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	200.00	0.00	31.58
NO. OBS.	0.	0.	0.	0.	41.	55.	60.	51.	57.	54.	60.	0.	380.
CUSPS & OCC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	1.58
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	158.33	0.00	25.00
NO. OBS.	0.	0.	0.	0.	41.	55.	60.	53.	47.	54.	60.	0.	380.

# SNO7 SUNSET WFAEM CALIFORNIA SUMMARY FOR PERIOD STARTING 4- 8-69 AND ENDING 12-30-69.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
WEIGHT (FT)	0.00	0.00	0.00	2.94	3.60	2.91	2.86	3.25	3.63	5.00	0.00	6.27	3.86
MEAN	0.00	0.00	0.00	.85	1.17	.70	.90	.50	1.41	3.00	0.00	2.89	2.05
STD DEV	0.00	0.00	0.00	16.	10.	11.	7.	4.	8.	3.	0.	15.	74.
NO. OBS.	0.	0.	0.	16.	10.	11.	7.	4.	8.	3.	0.	15.	74.
PERIOD (SEC)													
MEAN	0.00	0.00	0.00	10.68	12.92	11.81	11.42	9.33	12.41	10.90	0.00	14.09	12.02
STD DEV	0.00	0.00	0.00	1.91	1.48	2.71	3.13	.95	3.62	2.33	0.00	2.86	2.74
NO. OBS.	0.	0.	0.	16.	10.	11.	6.	4.	8.	3.	0.	14.	72.
DIRECTION													
COMPASS SECTOR													
O OCC. N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	22.22	70.00	42.86	100.00	75.00	66.67	0.00	69.23	47.14
W	0.00	0.00	0.00	75.00	77.78	30.00	82.86	0.00	12.50	33.33	0.00	15.38	41.43
NW	0.00	0.00	0.00	25.00	0.00	0.00	14.29	0.00	12.50	0.00	0.00	15.38	11.43
N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	16.	9.	10.	7.	4.	8.	3.	0.	13.	70.
WFAEM TYPE													
SOCC SPILL	0.00	0.00	0.00	87.50	90.00	100.00	100.00	100.00	100.00	66.67	0.00	26.67	79.73
SP/PL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PLUNGE	0.00	0.00	0.00	12.50	10.00	0.00	0.00	0.00	0.00	33.33	0.00	73.33	20.27
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	0.	0.	0.	16.	10.	11.	7.	4.	8.	3.	0.	15.	74.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	0.00	0.00	0.00	-.43	.23	.02	-.94	-1.93	-.96	-1.06	0.00	-.64	-.51
GROSS MEAN	0.00	0.00	0.00	.97	.82	1.17	1.61	1.93	1.10	.75	0.00	.97	1.10
STD DEV	0.00	0.00	0.00	.66	.72	1.09	.77	1.56	.67	.71	0.00	1.08	.83
NO. OBS.	0.	0.	0.	16.	10.	11.	7.	4.	8.	3.	0.	15.	74.
FORESHORE SLOPE													
MEAN (DEG)	0.00	0.00	0.00	2.60	3.00	3.91	5.29	4.25	5.00	3.50	0.00	4.33	3.87
STD DEV	0.00	0.00	0.00	.83	1.12	1.14	2.56	.50	1.31	.71	0.00	.90	1.49
NO. OBS.	0.	0.	0.	15.	9.	11.	7.	4.	8.	2.	0.	15.	71.
RIPS X OCC	0.00	0.00	0.00	53.33	0.00	0.00	14.29	0.00	0.00	33.33	0.00	66.67	24.24
MEAN SPAC.	0.00	0.00	0.00	425.00	0.00	0.00	200.00	0.00	0.00	500.00	0.00	500.00	208.71
NO. OBS.	0.	0.	0.	15.	9.	11.	7.	4.	8.	3.	0.	9.	66.
CUSPS X OCC.	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	33.33	0.00	40.00	14.81
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	50.00	0.00	100.00	47.22
NO. OBS.	0.	0.	0.	6.	2.	9.	7.	4.	8.	3.	0.	15.	54.

5007 GUNST HEAR  
CALIFORNIA  
SUMMARY FOR PIMUD STAMING 1-6-72 AS- P-11-70.

[illegible]

# 5007 SUNSET BEACH CALIFORNIA SUMMARY FOR PERIOD STARTING 1- 3-71 AND ENDING 12-31-71.

## SURF OBS.

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
HEIGHT (FT)	2.88	2.73	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	3.20	3.13	2.81
MEAN	.89	.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.51	.94	.74	.81
STD DEV	16.	11.	1.	0.	0.	0.	0.	0.	0.	15.	15.	15.	73.
NO. OBS.													

## PERIOD (SEC)

MEAN	11.25	10.70	10.00	0.00	0.00	0.00	0.00	0.00	0.00	10.17	9.64	10.97	10.52
STD DEV	1.51	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36	1.89	2.66	1.88
NO. OBS.	16.	9.	1.	0.	0.	0.	0.	0.	0.	15.	16.	15.	72.

## DIRECTION

### COASTAL SPECTRUM

WAVE OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	93.75	93.33	97.18
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	6.67	2.82
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	13.	11.	1.	0.	0.	0.	0.	0.	0.	15.	16.	15.	71.

## BREAKER TYPE

WAVE TYPE	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.59	0.00	0.00	17.57
SP/PL	75.00	72.73	100.00	0.00	0.00	0.00	0.00	0.00	0.00	11.76	81.25	30.77	54.05
PLUNGE	18.75	27.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.74	18.75	69.23	27.03
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	1.35
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	16.	11.	1.	0.	0.	0.	0.	0.	0.	17.	16.	13.	74.

## CURRENT OBS.

### (FT/SEC)

NET MEAN	-0.23	-0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.76	-1.13	-0.74	-0.65
GROSS MEAN	.44	.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.86	1.13	.74	.75
STD DEV	.39	.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.87	.72	.46	.63
NO. OBS.	12.	7.	1.	0.	0.	0.	0.	0.	0.	17.	15.	15.	67.

## FORESHORE SLOPE

MEAN (DEG)	2.50	2.18	2.00	0.00	0.00	0.00	0.00	0.00	0.00	8.76	3.69	2.43	3.22
STD DEV	.94	.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52	1.58	1.16	1.60
NO. OBS.	14.	11.	1.	0.	0.	0.	0.	0.	0.	17.	16.	18.	73.

## RIPS & OCC

### MEAN SPAC.

MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.71	0.00	0.00	14.47
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	184.55	0.00	0.00	41.28
NO. OBS.	16.	11.	1.	0.	0.	0.	0.	0.	0.	17.	16.	15.	76.

## CUSPS & OCC.

### MEAN SPAC.

MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.41	0.00	0.00	6.58
STD DEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	147.00	0.00	0.00	32.88
NO. OBS.	16.	11.	1.	0.	0.	0.	0.	0.	0.	17.	16.	15.	76.

## 5007 SHIPSET BEACH

## CALIFORNIA

SUMMARY FOR PERIOD STARTING 1-2-72 AND ENDING 12-31-72.

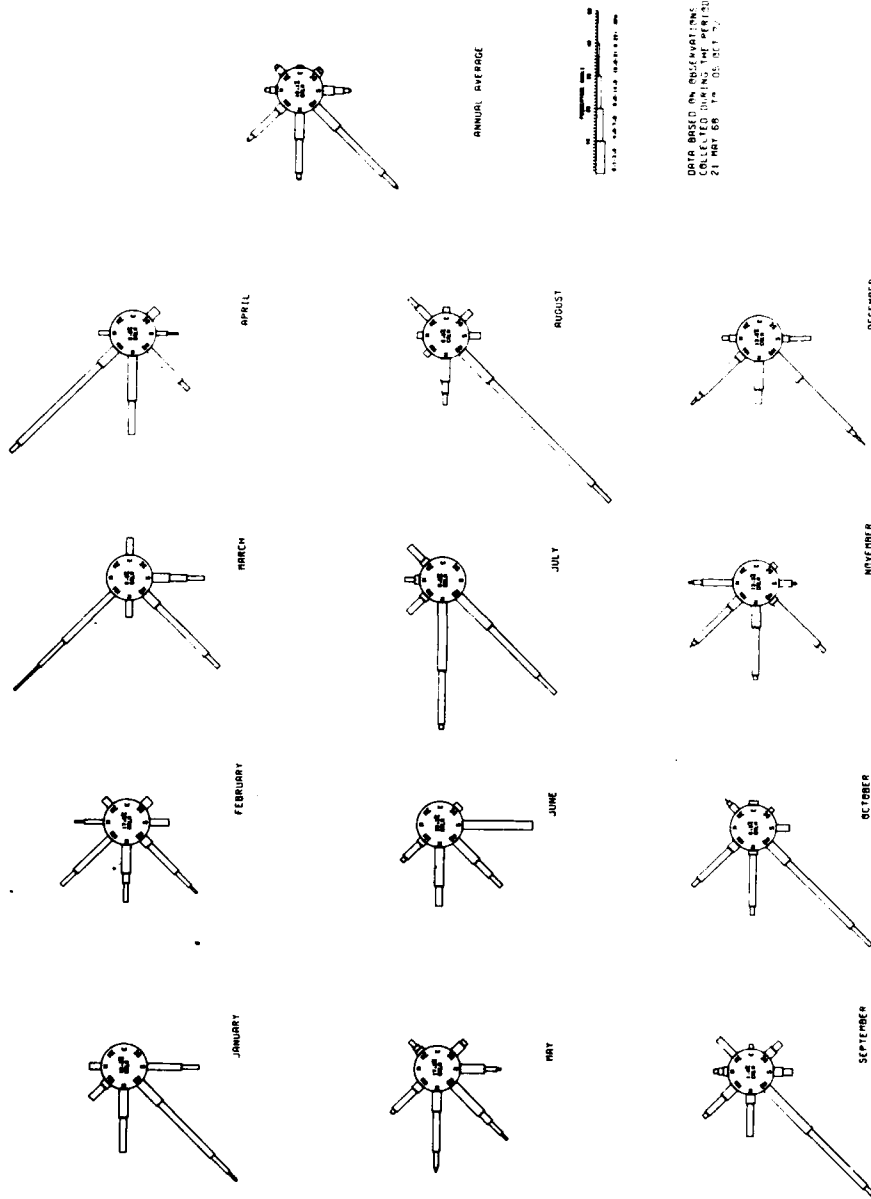
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
MEAN	3.30	2.73	2.70	2.20	2.53	3.33	0.00	2.00	2.00	3.00	3.50	3.20	2.82
STD DEV	.44	.59	.67	.45	.62	.58	0.00	0.00	.50	0.00	2.12	1.03	.83
NO. OBS.	23.	15.	10.	5.	17.	3.	0.	1.	9.	5.	2.	10.	100.
PERIOD (SEC)													
MEAN	11.27	11.51	11.48	9.88	11.80	9.33	0.00	12.70	11.58	11.38	15.90	11.47	11.51
STD DEV	1.46	1.64	.70	1.11	4.23	1.53	0.00	0.00	1.93	2.86	5.21	1.37	2.46
NO. OBS.	23.	15.	9.	4.	17.	3.	0.	1.	10.	4.	3.	10.	99.
DIRECTION													
COASTAL SECTOR													
OCC. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00
3	100.00	100.00	100.00	100.00	100.00	100.00	0.00	100.00	83.33	20.00	0.00	0.00	1.94
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	100.00	100.00	97.09
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	.97
NO. OBS.	22.	15.	10.	5.	17.	3.	0.	1.	12.	5.	3.	10.	103.
BREAKER TYPE													
XOCC SPILL	26.09	20.00	10.00	0.00	18.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.87
SPAPL	47.83	60.00	80.00	100.00	62.50	100.00	0.00	100.00	30.00	40.00	33.33	60.00	58.42
PLUNGE	21.74	20.00	10.00	0.00	18.75	0.00	0.00	0.00	70.00	60.00	66.67	40.00	27.72
SURGE	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.99
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	23.	15.	10.	5.	16.	3.	0.	1.	10.	5.	3.	10.	101.
CURRENT OBS.													
(FI/SEC)													
NET MEAN	-0.40	-0.30	-0.27	-0.37	-0.58	-0.92	0.00	0.00	-0.10	.57	-0.21	-0.31	-0.32
GROSS MEAN	.58	.82	.53	1.03	.78	.92	0.00	0.00	.84	1.07	.21	.51	.70
STD DEV	.44	.41	.42	.52	.45	.79	0.00	0.00	1.46	.88	.42	.36	.62
NO. OBS.	23.	15.	11.	4.	16.	3.	0.	1.	11.	5.	2.	10.	101.
FORESHORE SLOPE													
MEAN (DEG)	2.39	2.33	2.20	3.20	3.25	2.67	0.00	7.00	4.36	3.60	4.00	2.60	2.93
STD DEV	1.37	.90	.63	.45	.68	.58	0.00	0.00	1.57	1.67	1.00	1.78	1.39
NO. OBS.	21.	15.	10.	5.	16.	3.	0.	1.	11.	5.	3.	10.	102.
RIPS & OCC	39.13	13.33	0.00	0.00	5.88	0.00	0.00	0.00	8.33	0.00	0.00	0.00	12.38
MEAN SPAC.	300.00	500.00	0.00	0.00	43.00	0.00	0.00	0.00	802.00	0.00	0.00	0.00	235.76
NO. OBS.	23.	15.	11.	5.	17.	3.	0.	1.	12.	5.	3.	10.	105.
CUSPS & OCC	39.13	13.33	0.00	0.00	11.76	33.33	0.00	0.00	8.33	0.00	66.67	0.00	16.19
MEAN SPAC.	159.84	200.00	0.00	0.00	50.00	20.00	0.00	0.00	200.00	0.00	150.00	0.00	99.31
NO. OBS.	23.	15.	11.	5.	17.	3.	0.	1.	12.	5.	3.	10.	105.

SUMMARY FOR PERIOD STARTING 1- 2-73 AND ENDING 3- 6-73													
CALIFORNIA													
5007 SUNSET BEACH													
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ALL OBS.
SURF OBS.													
HEIGHT (FT)													
MEAN	3.43	3.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.29
STD DEV	1.27	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14
NO. OBS.	7.	7.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.
PERIOD (SEC)													
MEAN	10.89	11.01	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.89
STD DEV	1.65	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45
NO. OBS.	7.	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
DIRECTION													
COASTAL SECTOR													
0 OCC.	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	7.	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
BREAKER TYPE													
XUCC SPILL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SP/PL	100.00	85.71	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.86
PLUNGE	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14
SURGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	6.	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	14.
CURRENT OBS.													
(FT/SEC)													
NET MEAN	-0.50	0.00	-0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.32
GROSS MEAN	0.61	0.49	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75
STD DEV	0.50	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52
NO. OBS.	7.	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
FORESHORE SLOPE													
MEAN (DEG)	2.43	2.71	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.53
STD DEV	1.13	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92
NO. OBS.	7.	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
RIPS % OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	7.	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.
CUSPS % OCC													
MEAN SPAC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NO. OBS.	7.	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	15.



# CALIFORNIA

## WIND ROSES 5007 SUNSET



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